

329 IAC 10-1-4 Records and standards for submitted information

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 4. (a) Any owner, operator, or permittee required to monitor under this article or by any permit issued under this article, shall maintain all records of all monitoring information and monitoring activities, including:

- (1) the date, exact place, and time of the sampling measurements;
- (2) the sampling methods used;
- (3) the person or persons who performed the sampling or measurements;
- (4) the date or dates analyses were performed;
- (5) the person or persons who performed the analyses;
- (6) the analytical techniques or methods used;
- (7) the results of such measurements or analyses; and
- (8) all quality assurance/quality control documentation.

(b) The owner, operator, or permittee of a solid waste land disposal facility shall record and retain at the facility in an operating record, or, in an alternative location approved by the commissioner, any records required by this article.

(c) All records of monitoring activities required by this article and results thereof shall be retained by the owner, operator, or permittee of a solid waste land disposal facility for three (3) years, unless otherwise specified in this article. The three (3) year period shall be extended:

- (1) automatically during the course of any unresolved litigation between the commissioner and a permittee of a solid waste land disposal facility; or
- (2) as required by the permit conditions.

Added section:

329 IAC 10-1-2.5 Incorporation by reference

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 4-22-2-21, IC 13-30-2; IC 36-9-30

Sec. 2.5. Unless specified in the incorporated by reference documents incorporated in this article, the version of documents referenced in the incorporated by reference documents is the latest version that is in effect on the date of the latest adoption of the incorporated by reference documents in this article.

329 IAC 10-1-4 Records and standards for submitted information

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 4. (a) Any owner, operator, or permittee required to monitor under this article or by any permit issued under this article, shall maintain all records of all monitoring information and monitoring activities, including:

- (1) the date, exact place, and time of the sampling measurements;
- (2) the sampling methods used;
- (3) the person or persons who performed the sampling or measurements;
- (4) the date or dates analyses were performed;
- (5) the person or persons who performed the analyses;
- (6) the analytical techniques or methods used;
- (7) the results of such measurements or analyses; and
- (8) all quality assurance/quality control documentation.

(b) The owner, operator, or permittee of a solid waste land disposal facility shall record and retain at the facility in an operating record, or, in an alternative location approved by the commissioner, any records required by this article.

(c) All records of monitoring activities required by this article and results thereof shall be retained by the owner, operator, or permittee of a solid waste land disposal facility for three (3) years, unless otherwise specified in this article. The three (3) year period shall be extended:

- (1) automatically during the course of any unresolved litigation between the commissioner and a permittee of a solid waste land disposal facility; or
- (2) as required by the permit conditions.

(d) Information submitted to the department to meet a requirement of this article must meet the following standards:

- (1) All drawings, plans, maps, and documentation must be properly titled.
- (2) All drawings, plans, and maps must include the following:
 - (A) The date and author of each drawing, plan, or map.
 - (B) Documentation of the coordinate system of the drawing, plan, or map, including the following:
 - (i) Measurement units.
 - (ii) Datum.
 - (iii) Identification of the coordinate system that was used such as the Universal Transverse Mercator or the State Plane coordinate system.
 - (C) A bar scale on each drawing, plan, or map.
 - (D) Elevations that correlate with United States Geological Survey mean sea level data.
 - (E) The facility name.
 - (F) The state regulatory identification number, such as permit number or authorization number.
 - (G) The facility's United States Environmental Protection Agency identification number, if available.
 - (H) A north arrow.
 - (I) A map legend.

329 IAC 10-1-4.5 Electronic submission of information

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 4.5. (a) Electronic submission of information required by this article may be requested by the commissioner. The format and submittal mechanism will be prescribed by the commissioner. Any information submitted on electronic media also must be submitted as a paper copy or copies as required by this article.

(d) Information submitted to the department to meet a requirement of this article must meet the following standards:

- (1) All drawings, plans, maps, and documentation must be properly titled and must include the following where applicable:
 - (A) The date and author of each drawing, plan, or map.
 - (B) Documentation of the coordinate system of the drawing, plan, or map, including the following:
 - (i) Measurement units.
 - (ii) Datum.
 - (iii) Identification of the coordinate system that was used such as the Universal Transverse Mercator or the State Plane coordinate system.
 - (C) A bar scale on each drawing, plan, or map.
 - (D) Elevations that correlate with United States Geological Survey mean sea level data.
 - (E) The facility name.
 - (F) The state regulatory identification number, such as a permit number or authorization number.
 - (G) The facility's United States Environmental Protection Agency identification number, if available.
 - (H) A north arrow.
 - (I) A map legend.
- (2) Submittals of sampling and monitoring results must include the following:
 - (A) Results of laboratory analyses.
 - (B) Results of field measurements, including water elevations and well depths, if applicable.
 - (C) Laboratory name.
 - (D) Date of the sampling or monitoring event.

329 IAC 10-1-4.5 Electronic submission of information

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 4.5. (a) Electronic submission of information that is required by this article may be requested by the commissioner. The format and submittal mechanism will be prescribed by the commissioner. Any information submitted on electronic media also must be submitted as a paper copy or copies, unless the commissioner makes a determination that only an electronic copy is

(b) Electronically submitted information must meet the following requirements:

- (1) Section 4 of this rule.
- (2) The submittal deadlines of this article.

(c) In addition to the requirements of subsection (b), submittals of drawings, plans, or maps must meet one (1) of the following requirements:

- (1) Be submitted in one (1) of the following coordinate systems:
 - (A) Universal Transverse Mercator.
 - (B) State Plane coordinate system.
 - (C) North American Datum (NAD) 1983 or NAD 1927 that includes a description of the coordinates on the document as annotation or described in a text file included with the drawing, plot plan, or map file. The description must include the following:
 - (i) Measurement units.
 - (ii) Datum.
 - (iii) Identification of the coordinate system.
- (2) Provide information regarding the survey coordinate system used to create the drawings, plans, or maps, including the following:
 - (A) At least two (2), but preferably four (4) or more reference locations, field marked and of at least the third order, on each drawing, plan, or map if the site was surveyed.
 - (B) Coordinates for the reference locations in clause (A) should be supplied in either Universal Transverse Mercator or State Plane coordinate system and may be submitted in a separate text file or as annotation on the drawing, plan, or map.
 - (C) The degree of accuracy, precision, and the manner in which coordinates in clause (A) were determined for the reference coordinates is documented in a narrative on the drawing, plan, or map or in a metadata file.

(d) In addition to requirements of subsection (b), submittals of sampling and monitoring results must include the following:

- (1) Results of laboratory analyses.
- (2) Results of field measurements, including water elevations and well depths, if applicable.
- (3) Laboratory name.
- (4) Date of the sampling or monitoring event.

needed.

(b) Electronically submitted information must meet the following requirements:

- (1) Section 4 of this rule.
- (2) The submittal deadlines of this article.

(c) In addition to the requirements of subsection (b), submittals of drawings, plans, or maps must meet one (1) of the following requirements:

- (1) Be submitted in one (1) of the following coordinate systems:
 - (A) Universal Transverse Mercator.
 - (B) State Plane coordinate system.
 - (C) North American Datum (NAD) 1983 or NAD 1927 that includes a description of the coordinates on the document as annotation or described in a text file included with the drawing, plot plan, or map file. The description must include the following:
 - (i) Measurement units.
 - (ii) Datum.
 - (iii) Identification of the coordinate system.
- (2) Provide information regarding the survey coordinate system used to create the drawing, plan, or map, including the following:
 - (A) At least two (2), but preferably four (4) or more reference locations, field marked and of at least the third order, on each drawing, plan, or map if the site was surveyed.
 - (B) Coordinates for the reference locations in clause (A) should be supplied in either Universal Transverse Mercator or State Plane coordinate system and may be submitted in a separate text file or as annotation on the drawing, plan, or map.
 - (C) The degree of accuracy, precision, and the manner in which coordinates in clause (A) were determined for the reference coordinates is documented in a narrative on the drawing, plan, or map or in a metadata file.

329 IAC 10-2-63.5 “Electronic submission” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 63.5. “Electronic submission” means any submission of information to IDEM via electronic media. Such media may include the following:

- (1) Magnetic storage tape or disk.
- (2) Compact disc read-only memory (CD-ROM).
- (3) Electronic mail and/or attachments.
- (4) File transfer protocol (FTP).
- (5) Hypertext transfer protocol (HTTP).

329 IAC 10-2-64 “Endangered species” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 64. “Endangered species” has the meaning set forth in means any species listed as endangered or threatened under rules of the natural resource commission at 312 IAC 9-3-19, 312 IAC 9-4-14, 312 IAC 9-5-4, and 312 IAC 9-6-9, or 312 IAC 9-9-4.

329 IAC 10-2-66.3 “Erosion and sediment control system” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 66.3. “Erosion and sediment control system” means the use of appropriate erosion and sediment control measures to minimize sedimentation by first reducing or eliminating erosion at the source, and then as necessary, trapping sediment to prevent it from being discharged from or within a project site.

329 IAC 10-2-96 “Infectious waste” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 96. “Infectious waste” has the meaning set forth in the rules of the state board of health at 410 IAC 1-3-10, as supported by the ancillary definitions of 410 IAC 1-3. and applies to facilities regulated under 410 IAC 1-3.

329 IAC 10-2-97.1 “Insignificant facility modification” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 97.1. “Insignificant facility modification”

329 IAC 10-2-63.5 “Electronic submission” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 63.5. “Electronic submission” means any submission of information to the department via electronic media. Such media may include the following:

- (1) Magnetic storage tape or disk.
- (2) Compact disc read-only memory (CD-ROM).
- (3) Electronic mail and/or attachments.
- (4) File transfer protocol (FTP).
- (5) Hypertext transfer protocol (HTTP).

329 IAC 10-2-64 “Endangered species” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 64. “Endangered species” has the meaning set forth in means any species listed as endangered or threatened under rules of the natural resources commission at 312 IAC 9-3-19, 312 IAC 9-4-14, 312 IAC 9-5-4, and 312 IAC 9-6-9, or 312 IAC 9-9-4.

329 IAC 10-2-66.3 “Erosion and sediment control system” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 66.3. “Erosion and sediment control system” means the use of appropriate erosion and sediment control measures to minimize sedimentation by first reducing or eliminating erosion at the source, and then as necessary, trapping sediment to prevent it from being discharged from or within a facility boundary.

329 IAC 10-2-96 “Infectious waste” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 96. “Infectious waste” has the meaning set forth in the rules of the state department of health at 410 IAC 1-3-10, as supported by the ancillary definitions of 410 IAC 1-3. and applies to facilities regulated under 410 IAC 1-3.

329 IAC 10-2-97.1 “Insignificant facility modification” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 97.1. “Insignificant facility modification”

means the following:

- (1) Relocation of a solid waste land disposal facility waste hauling road.
- (2) Relocation of office buildings.
- (3) Changes in sequences of filling in permitted areas.
- (4) Installation of temporary sediment control measures.
- (5) Installation of leachate control systems to prevent leachate migration off-site.
- (6) Installation of additional methane venting wells to an approved system.
- (7) Installation of weighing scales.
- (8) Replacement of a **ground water** monitoring well **or piezometer** no more than ~~ten (10)~~ **fifteen (15)** feet horizontally from the original location and at an equal depth.
- (9) An alternative daily cover (ADC) under 329 IAC 10-20-14.1(c).
- (10) Approvals granted under 329 IAC 10-21 unless the commissioner determines otherwise.
- (11) ~~Any modification to the solid waste land disposal facility that the commissioner determines will improve the operation of the facility without significantly altering the approved solid waste land disposal permit.~~ **Alternative storage methods for salvaged and recycled materials under 329 IAC 10-20-6(b).**
- (12) An ADC under 329 IAC 10-20-14.1(d).
- (13) Improvements to drainage at the facility **or modifications to sediment controls.**
- (14) **Changes in the frequency that collection containers regulated under 329 IAC 10-20-4(g)(1) and 329 IAC 10-20-4(g)(2) must be emptied.**
- (15) **Any modification to the solid waste land disposal facility that the commissioner determines will improve the operation of the facility without significantly altering the approved solid waste land disposal permit.**

329 IAC 10-2-99 "Karst terrain" defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 99. "Karst ~~terrains~~ **terrain**" means an area where karst topography, ~~with its~~ **including the** characteristic surface and subterranean features, ~~is has~~ developed as the result of dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present ~~to in~~ karst terrains

means the following:

- (1) Relocation of a solid waste land disposal facility waste hauling road.
- (2) Relocation of office buildings.
- (3) Changes in sequences of filling in permitted areas.
- (4) Installation of temporary sediment control measures.
- (5) Installation of leachate control systems to prevent leachate migration off-site.
- (6) Installation of additional methane venting wells to an approved system.
- (7) Installation of weighing scales.
- (8) Replacement of a **ground water** monitoring well **or piezometer** no more than ~~ten (10)~~ **fifteen (15)** feet horizontally from the original location and at an equal depth.
- (9) ~~Use of~~ an alternative daily cover (ADC) under 329 IAC 10-20-14.1(c).
- (10) Approvals granted under 329 IAC 10-21 unless the commissioner determines ~~otherwise the~~ **approval to be a minor modification.**
- (11) ~~Any modification to the solid waste land disposal facility that the commissioner determines will improve the operation of the facility without significantly altering the approved solid waste land disposal permit.~~ **Alternative storage methods for salvaged or recycled materials under 329 IAC 10-20-6(b).**
- (12) ~~An ADC under 329 IAC 10-20-14.1(d).~~ **Changes in the frequency that collection containers regulated under 329 IAC 10-20-4(g)(1) and 329 IAC 10-20-4(g)(2) must be emptied.**
- (13) Improvements to drainage at the facility **or modifications to sediment controls.**
- (14) **Use of an ADC under 329 IAC 10-20-14.1(d).**
- (15) **Any modification to the solid waste land disposal facility that the commissioner determines will improve the operation of the facility without significantly altering the approved solid waste land disposal permit.**

329 IAC 10-2-99 "Karst terrain" defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 99. "Karst ~~terrains~~ **terrain**" means an area where karst topography, ~~with its~~ **including the** characteristic surface and subterranean features, ~~is has~~ developed as the result of dissolution of limestone, dolomite, or other soluble rock. Characteristic

include any of the following:

- (1) Sinkholes.
- (2) Sinking streams.
- (3) Caves.
- (4) Large springs.
- (5) Blind valleys.

329 IAC 10-2-105.3 “Licensed professional geologist” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 25-17.6-1-6.5; IC 36-9-30

Sec. 105.3. “Licensed professional geologist” means a person who is licensed as a geologist by the state under IC 25-17.6-1-6.5.

329 IAC 10-2-109 “Major modification of solid waste land disposal facilities” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 109. “Major modification of solid waste land disposal facilities” means any increase in a permitted solid waste land disposal facility that would:

- (1) increase the permitted capacity to process or dispose of solid waste by the lesser of:
 - (A) more than ten percent (10%); or
 - (B) five hundred thousand (500,000) cubic yards; or
- (2) ~~change~~ **increase** the permitted solid waste boundary by more than one (1) acre.

329 IAC 10-2-112 “Minor modification of solid waste land disposal facilities” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 112. (a) “Minor modification of solid waste land disposal facilities” means any increase in a permitted solid waste land disposal facility that would not:

- (1) increase the facility’s permitted capacity to dispose of solid waste by the lesser of:
 - (A) more than ten percent (10%); or

physiographic features present ~~to~~ **in** karst terrains **or characteristics of karst terrains** include any of the following:

- (1) Sinkholes.
- (2) Sinking streams.
- (3) Caves.
- (4) Large springs.
- (5) Blind valleys.
- (6) **Grikes.**
- (7) **Karren.**
- (8) **Solution widened joints or bedding planes.**
- (9) **Loss of drilling fluid during core drilling.**
- (10) **Anasotmosis, and conduits of less than one meter, but more than 2.5 millimeters.**
- (11) **Karst Aquifer.**

329 IAC 10-2-105.3 “Licensed professional geologist” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 25-17.6-1-6.5; IC 36-9-30

Sec. 105.3. “Licensed professional geologist” has the meaning set forth in IC 25-17.6-1-6.5.

329 IAC 10-2-109 “Major modification of solid waste land disposal facilities” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 109. “Major modification of solid waste land disposal facilities” means any increase in a permitted solid waste land disposal facility that would:

- (1) increase the permitted capacity to process or dispose of solid waste by the lesser of:
 - (A) more than ten percent (10%); or
 - (B) five hundred thousand (500,000) cubic yards; or
- (2) ~~change~~ **increase the area within** the permitted solid waste boundary by more than one (1) acre.

10-2-111.5 “Measurable storm event” was deleted

329 IAC 10-2-112 “Minor modification of solid waste land disposal facilities” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 112. (a) “Minor modification of solid waste land disposal facilities” means any ~~increase~~ **modification** in a permitted solid waste land disposal facility that would not:

- (1) increase the facility’s permitted capacity to dispose of solid waste by the lesser of:

- (B) five hundred thousand (500,000) cubic yards;
- (2) change the permitted solid waste boundary by more than one (1) acre;
- (3) include those items determined to be insignificant modifications by 329 IAC 10-3-3(b) or by the commissioner; or
- (4) include those items determined to be major modifications by section 109 of this rule.

(b) The term includes:

- (1) an alternative daily cover (ADC) under 329 IAC 10-20-14.1(e); ~~and~~
- (2) a baled waste management plan under 329 IAC 10-20-31(3); ~~and~~

(3) a borrow pit:

- (A) owned by the facility;**
- (B) not previously permitted by the department on the latest effective date of this section; and**
- (C) located on-site or on property adjoining the facility.**

329 IAC 10-2-151 “Registered land surveyor” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 25-31; IC 36-9-30

Sec. 151. “Registered land surveyor” means a land surveyor registered by the state under IC 25-31.

329 IAC 10-2-158 “Responsible corporate officer” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 25-31; IC 36-9-30

Sec. 158. “Responsible corporate officer” means a president, secretary, treasurer, or any vice president of the corporation **or division** in charge of a principal business function that includes the activity to be permitted.

- (A) more than ten percent (10%); or
- (B) five hundred thousand (500,000) cubic yards;

- (2) ~~change~~ **increase the area within** the permitted solid waste boundary by more than one (1) acre;
- (3) include those items determined to be insignificant modifications by 329 IAC 10-3-3(b) or by the commissioner; or
- (4) include those items determined to be major modifications by section 109 of this rule.

(b) ~~The term includes~~ **A minor modification may include the addition or modification of:**

- (1) an alternative daily cover (ADC) under 329 IAC 10-20-14.1(e); ~~and~~
- (2) a baled waste management plan under 329 IAC 10-20-31(3); ~~and~~

(3) a borrow pit:

- (A) owned by the owner, operator, or permittee;**
- (B) not permitted by the department before January 1, 2004; and**
- (C) located on-site or on property adjoining the facility.**

329 IAC 147.2 “Qualified professional” was deleted

329 IAC 10-2-151 “Registered land surveyor” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 25-31; IC 36-9-30

Sec. 151. “Registered land surveyor” means a land surveyor registered by the ~~state~~ **Board of Registration for Land Surveyors** under ~~IC 25-31~~ **IC 25-21.5**.

329 IAC 10-2-158 “Responsible corporate officer” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 25-31; IC 36-9-30

Sec. 158. “Responsible corporate officer” means a president, secretary, treasurer, or any vice president of the corporation **or corporate division** in charge of a principal business function that includes the activity to be permitted.

329 IAC 10-2-181.2 “Storm water discharge” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 181.2. “Storm water discharge” means the release or flow of storm water which leaves the facility’s property or enters a water of the state.

329 IAC 10-2-181.5 “Storm water pollution prevention plan” or “SWP3” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 181.5. “Storm water pollution prevention plan” or “SWP3” means a written plan to minimize the impact of storm water pollutants resulting from construction and landfill operation activities.

329 IAC 10-2-187.5 “Temporary stabilization” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 187.5. “Temporary stabilization” means the covering of soil to ensure its resistance to erosion, sliding, or other movement. The term includes vegetative cover, anchored mulch, or other nonerosive material applied at a uniform density of seventy percent (70%) across the disturbed area.

329 IAC 10-3-1 Exclusions; general

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-14; IC 13-19-3; IC 13-20; IC 36-9-30

Sec. 1. The following solid waste management activities are not subject to the provisions of this article:

- (1) Disposing of only uncontaminated rocks, bricks, concrete, road demolition waste materials, or dirt.
- (2) Land application activities regulated ~~by 327 IAC 6~~ **under rules of the water pollution control board at 327 IAC 6.1 and 327 IAC 7.1.**
- (3) Confined feeding control activities regulated ~~by IC 13-18-10~~ **under 327 IAC 16.**
- (4) Wastewater discharge activities regulated ~~by 327 IAC 5~~ **under rules of the water pollution control board at 327 IAC 5.**
- (5) Solid waste management activities regulated ~~by 329 IAC 11~~ **under 329 IAC 11.**

329 IAC 10-2-181.2 “Storm water discharge” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 181.2. “Storm water discharge” means the release or flow of storm water past the facility boundary or into a water of the state.

329 IAC 10-2-181.5 “Storm water pollution prevention plan” or “SWP3” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 181.5. “Storm water pollution prevention plan” or “SWP3” means a written plan developed to minimize the impact of storm water pollutants resulting from construction and landfill operation activities.

329 IAC 10-2-187.5 “Temporary stabilization” defined

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 187.5. “Temporary stabilization” means the covering of soil to ensure the resistance of the soil to erosion, sliding, or other movement. The term includes vegetative cover, anchored mulch, or other nonerosive material applied at a uniform density of seventy percent (70%) across the disturbed area.

329 IAC 10-3-1 Exclusions; general

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-14; IC 13-19-3; IC 13-20; IC 36-9-30

Sec. 1. The following solid waste management activities are not subject to the provisions of this article:

- (1) ~~Disposing~~ **Disposal** of only uncontaminated rocks, bricks, concrete, road demolition waste materials, or dirt.
- (2) Land application activities regulated ~~by 327 IAC 6~~ **under rules of the water pollution control board at 327 IAC 6.1 and 327 IAC 7.1.**
- (3) Confined feeding control activities regulated ~~by IC 13-18-10~~ **under rules of the water pollution control board at 327 IAC 16.**
- (4) Wastewater discharge activities regulated ~~by 327 IAC 5~~ **under rules of the water pollution control board at 327 IAC 5.**
- (5) Solid waste management activities regulated ~~by 329 IAC 11~~ **under 329 IAC 11.**

(6) Disposal of saw dust which is derived from processing untreated natural wood **uncontaminated and untreated natural growth solid waste, including tree limbs, stumps, leaves, and grass clippings.**

(7) The Disposal of coal ash, transported by water, into an ash pond which has received a water pollution control facility construction permit under 327 IAC 3 saw dust derived from processing **untreated natural wood.**

(8) The operation of surface impoundments; however, the final disposal of solid waste in such facilities at the end of their operation is subject to approval by the commissioner except as excluded under subdivisions (7) and (9): **Disposal of coal ash, transported by water, into an ash pond which has received a water pollution control facility construction permit under rules of the water pollution control board at 327 IAC 3.**

(9) The disposal of coal ash at a site receiving a total of less than one hundred (100) cubic yards per year from generators who each produce less than one hundred (100) cubic yards per year: **operation of surface impoundments; however, the final disposal of solid waste in such facilities at the end of their operation is subject to approval by the commissioner except as excluded under subdivisions (8) and (10).**

(10) Uses and The disposal of coal waste as exempted from regulation in IC 13-19-3: **ash at a site receiving a total of less than one hundred (100) cubic yards per year from generators who each produce less than one hundred (100) cubic yards per year.**

(11) The legitimate use of iron and steelmaking slags including the use as a base for road building, but not including use for land reclamation except as allowed under subdivision (13): **uses and disposal of coal waste as exempted under IC 13-19-3-3.**

(12) The legitimate use of foundry sand which has been demonstrated to the satisfaction of the commissioner as suitable for restricted waste site type HH under the provisions of 329 IAC 10-9-4, including the use as a base for road building, but not including use for land reclamation except as allowed under subdivision (13): **Activities concerning wastes containing polychlorinated biphenyls (PCBs) regulated under 329 IAC 4.1, except those regulated as alternative daily cover under 329 IAC 10-20-14.1.**

(13) Other uses of solid waste may be approved by the commissioner if the commissioner determines

(6) Disposal of saw dust which is derived from processing untreated natural wood **uncontaminated and untreated natural growth solid waste, including tree limbs, stumps, leaves, and grass clippings.**

(7) The Disposal of coal ash, transported by water, into an ash pond which has received a water pollution control facility construction permit under 327 IAC 3 saw dust derived from processing **untreated natural wood.**

(8) The operation of surface impoundments; however, the final disposal of solid waste in such facilities at the end of their operation is subject to approval by the commissioner except as excluded under subdivisions (7) and (9): **Disposal of coal ash, transported by water, into an ash pond which has received a water pollution control facility construction permit under rules of the water pollution control board at 327 IAC 3.**

(9) The disposal of coal ash at a site receiving a total of less than one hundred (100) cubic yards per year from generators who each produce less than one hundred (100) cubic yards per year: **operation of surface impoundments; however, the final disposal of solid waste in such facilities at the end of their operation is subject to approval by the commissioner except as excluded under subdivisions (8) and (10). The commissioner's approval is based on management practices that are protective of human health and the environment.**

(10) Uses and Disposal of coal waste as exempted from regulation in IC 13-19-3: **ash at a site receiving a total of less than one hundred (100) cubic yards per year from generators who each produce less than one hundred (100) cubic yards per year.**

(11) The legitimate use of iron and steelmaking slags including the use as a base for road building, but not including use for land reclamation except as allowed under subdivision (13): **uses and disposal of coal waste as exempted under IC 13-19-3-3.**

(12) The legitimate use of foundry sand which has been demonstrated to the satisfaction of the commissioner as suitable for restricted waste site type HH under the provisions of 329 IAC 10-9-4, including the use as a base for road building, but not including use for land reclamation except as allowed under subdivision (13): **Activities concerning wastes containing polychlorinated biphenyls (PCBs) regulated under 329 IAC 4.1, except those regulated as alternative daily**

them to be legitimate uses that do not pose a threat to public health and environment: Storage, transportation and processing of used oil as regulated under 329 IAC 13.

(14) The legitimate use of slag under IC 13-19-3-8.

(15) The legitimate use of foundry sand under IC 13-19-3-7.

(16) Any other use of solid waste approved by the commissioner based on the commissioner's determination that the use is a legitimate use that does not pose a threat to public health or the environment.

329 IAC 10-3-2 Exclusion; hazardous waste

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1

Affected: IC 13-14; IC 13-30; IC 36-9-30

Sec. 2. (a) Hazardous wastes are regulated by and shall be treated, stored, and disposed of in accordance with 329 IAC 3.1. Hazardous waste that is regulated by 329 IAC 3.1 is not subject to the provisions of this article.

(b) No hazardous waste that is regulated by 329 IAC 3.1 shall be disposed at any solid waste land disposal facility regulated under this article.

(c) As used in this article, "hazardous waste that is regulated by 329 IAC 3.1" does not include **CESQG** hazardous waste. ~~generated in quantities less than one hundred (100) kilograms per month and is therefore excluded from regulation under the hazardous waste management article, 329 IAC 3.1. Such small quantities of CESQG hazardous waste shall~~ **must only** be disposed of in **a municipal solid waste landfill permitted in** accordance with this article.

(d) Facilities permitted under 329 IAC 3.1 are not required to obtain permits under this article for the storage, treatment, or disposal of nonhazardous solid waste where such solid waste is treated or disposed of as a hazardous waste at the receiving hazardous waste facility.

cover under 329 IAC 10-20-14.1.

(13) Other uses of solid waste may be approved by the commissioner if the commissioner determines them to be legitimate uses that do not pose a threat to public health and environment: Storage, transportation and processing of used oil as regulated under 329 IAC 13.

(14) The legitimate use of slag under IC 13-19-3-8.

(15) The legitimate use of foundry sand under IC 13-19-3-7.

(16) Any other use of solid waste approved by the commissioner based on the commissioner's determination that the use is a legitimate use that does not pose a threat to public health or the environment.

329 IAC 10-3-2 Exclusion; hazardous waste

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1

Affected: IC 13-14; IC 13-30; IC 36-9-30

Sec. 2. (a) Hazardous wastes are regulated by and shall be treated, stored, and disposed of in accordance with 329 IAC 3.1. Hazardous waste that is regulated by 329 IAC 3.1 is not subject to the provisions of this article, **except as provided in subsection (c).**

(b) No hazardous waste that is regulated by 329 IAC 3.1 shall be disposed at any solid waste land disposal facility regulated under this article, **except as provided in subsection (c).**

(c) ~~As used in this article, "hazardous waste that is regulated by 329 IAC 3.1" does not include hazardous waste generated in quantities less than one hundred (100) kilograms per month and is therefore excluded from regulation under the hazardous waste management article, 329 IAC 3.1. Such small quantities of Hazardous waste shall~~ **generated by a conditionally exempt small quantity generator (CESQG hazardous waste), as regulated under 40 CFR 261.5, revised July 1, 2002, may only be disposed of in either :**

(1) a municipal solid waste landfill permitted in accordance with this article; **or,**

(2) a hazardous waste landfill permitted in accordance with 329 IAC 3.1.

(d) Facilities permitted under 329 IAC 3.1 are not required to obtain permits under this article for the storage treatment, or disposal of nonhazardous solid waste where such solid waste is treated or disposed of as a hazardous waste at the receiving hazardous waste

329 IAC 10-3-3 Insignificant facility modifications

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1

Affected: IC 13-14; IC 13-30; IC 36-9-30

Sec. 3. (a) A permittee of a solid waste land disposal facility proposing insignificant facility modifications may not be required to apply for a minor or a major modification of the current permit from the commissioner. See the definition of insignificant facility modification at 329 IAC 10-2-97.1.

(b) If a permittee proposes or is required to make an insignificant facility modification described in 329 IAC 10-2-97.1(1), 329 IAC 10-2-97.1(2), 329 IAC 10-2-97.1(3), 329 IAC 10-2-97.1(4), 329 IAC 10-2-97.1(5), 329 IAC 10-2-97.1(6), 329 IAC 10-2-97.1(7), 329 IAC 10-2-97.1(8), 329 IAC 10-2-97.1(9), or ~~329 IAC 10-2-97.1(10)~~, **329 IAC 10-2-97.1(12)** the permittee shall provide notice to the commissioner ~~via certified mail~~ no later than seven (7) calendar days after the modification has been made. The notice shall include a detailed description of the project and the date the project was or is expected to be completed.

(c) If the permittee proposes to make an insignificant facility modification described in **329 IAC 10-2-97.1(10)**, 329 IAC 10-2-97.1(11), ~~or 329 IAC 10-2-97.1(12)~~, **329 IAC 10-2-97.1(13)**, **329 IAC 10-2-97.1(14)**, or **329 IAC 10-2-97.1(15)**, the permittee shall submit documentation of the proposed insignificant facility modifications to the commissioner. The documentation must include a detailed description of the proposed project.

(d) If the commissioner determines that insufficient documentation has been provided to evaluate whether or not the modification under subsection (c) is an insignificant modification, the permittee will be notified in writing within thirty (30) days after receipt of the information to the commissioner that the permittee must submit a new proposal concerning the insignificant modification.

~~(d)~~ (e) If the commissioner determines that the modification under subsection (c) is a major or minor modification, the permittee will be notified in writing within thirty (30) days after receipt of the information to the commissioner that the permittee must submit an application for a minor or major modification to the current permit.

~~(e)~~ (f) If the permittee does not receive notification

facility.

329 IAC 10-3-3 Insignificant facility modifications

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1

Affected: IC 13-14; IC 13-30; IC 36-9-30

Sec. 3. (a) A permittee of a solid waste land disposal facility proposing insignificant facility modifications may not be required to apply for a minor or a major modification of the current permit from the commissioner. See the definition of insignificant facility modification at 329 IAC 10-2-97.1.

(b) If a permittee proposes or is required to make an insignificant **facility** modification described in 329 IAC 10-2-97.1(1), ~~through 329 IAC 10-2-97.1(2)~~, **329 IAC 10-2-97.1(3)**, 329 IAC 10-2-97.1(4), ~~and 329 IAC 10-2-97.1(5)~~, 329 IAC 10-2-97.1(6), ~~through 329 IAC 10-2-97.1(7)~~, **329 IAC 10-2-97.1(8)**, **329 IAC 10-2-97.1(9)**, 329 IAC 10-2-97.1(10), **329 IAC 10-2-97.1(11)**, or **329 IAC 10-2-97.1(12)** the permittee shall provide notice to the commissioner ~~via certified mail~~ no later than seven (7) calendar days after the modification has been made. The notice shall include a detailed description of the project and the date the project was or is expected to be completed.

(c) If the permittee proposes to make an insignificant facility modification described in ~~329 IAC 10-2-97.1(5)~~, ~~329 IAC 10-2-97.1(11)~~, ~~or 329 IAC 10-2-97.1(12)~~, **329 IAC 10-2-97.1(13)**, **329 IAC 10-2-97.1(14)**, or **329 IAC 10-2-97.1(15)** the permittee shall submit documentation of the proposed insignificant facility modifications to the commissioner ~~via certified mail~~. The documentation must include a detailed description of the proposed project.

(d) If the commissioner determines that insufficient documentation has been provided to determine whether or not the proposed modification under subsection (c) is an insignificant facility modification, the permittee will be notified in writing by the commissioner within thirty (30) days after receipt of the proposal that the permittee must submit a new proposal for the insignificant modification.

~~(d)~~ (e) If the commissioner determines that the modification under subsection (c) is a major or minor modification, the permittee will be notified in writing within thirty (30) days after receipt of the information to the commissioner that the permittee must submit an application for a minor or major modification to the current permit.

from the commissioner within thirty (30) days after submission of the proposed modifications to the commissioner, the permittee may initiate the insignificant facility modifications in accordance with documentation provided to the commissioner.

~~(f)~~ (g) No permit modification shall be required for insignificant facility modifications made under this subsection to:

- (1) correct operational violations under this article;
- or
- (2) protect human health ~~and~~ or the environment.

329 IAC 10-10-1 Applicability

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 1. (a) Unless otherwise addressed in this rule, all MSWLFs and new and existing MSWLF units must comply with applicable requirements in this article after the effective date of this article.

(b) Within ~~one hundred twenty (120)~~ **sixty (60)** days following the effective date of this rule, the owner, operator, or permittee of a MSWLF permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, shall submit any necessary permit modification applications to comply with the requirements of this article.

~~(f)~~ (f) If the permittee does not receive notification from the commissioner within thirty (30) days after ~~submission~~ **receipt** of the proposed modifications to the commissioner, the permittee may initiate the insignificant facility modifications in accordance with documentation provided to the commissioner.

~~(f)~~ (g) No permit modification shall be required for insignificant facility modifications made under this subsection to:

- (1) correct operational violations under this article;
- or
- (2) protect human health ~~and~~ or the environment

329 IAC 10-10-1 Applicability

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 1. (a) Unless otherwise addressed in this rule, all MSWLFs and new and existing MSWLF units must comply with applicable requirements in this article ~~after the effective date of this article.~~

(b) Within one hundred twenty (120) days following ~~the effective date of this rule~~ **April 13, 1996**, the owner, operator, or permittee of a MSWLF permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, shall submit any necessary permit modification applications to comply with the requirements of this article.

(c) **On or before April 2, 2004, the owner, operator or permittee of an MSWLF shall submit any necessary permit modification applications to comply with the requirements of this article as amended on January 1, 2004, unless subsection (d) is applicable.**

(d) **On or before April 2, 2004, the owner, operator or permittee of an MSWLF shall submit information for the agency's approval which includes the SWP3 and associated information as required in 329 IAC 10-11-2.5(a)(10) through (13), 329 IAC 10-15-2(b)(10) and (11), 329 IAC 10-15-2(d)(4)(G) through (L), and 329 IAC 10-15-12. Approvals will be issued subject to the following schedule:**

- (1) Any owner, operator, or permittee of an MSWLF located in the counties of:
 - (A) Adams;
 - (B) Allen;
 - (C) Bartholomew;
 - (D) Benton;
 - (E) Blackford;

(F) Boone;
(G) Brown;
(H) Carroll;
(I) Cass;
(J) Clark;
(K) Clay;
(L) Clinton;
(M) Crawford;
(N) Daviess;
(O) Dearborn;
(P) Decatur;
(Q) DeKalb;
(R) Delaware;
(S) Dubois;
(T) Elkhart;
(U) Fayette;
(V) Floyd;
(W) Fountain;
(X) Franklin;
(Y) Fulton;
(Z) Gibson;
(AA) Grant; and
(BB) Greene;

in Indiana shall be issued an approval within sixty (60) days of the receipt of all information required. The sixty (60) day period shall be suspended from the date that a notice of deficiency has been issued by the department to the owner, operator, or permittee, until receipt by the department of a complete and technically adequate response to the notice of deficiency.

(2) Any owner, operator, or permittee of an MSWLF located in the counties of:

(A) Hamilton;
(B) Hancock;
(C) Harrison;
(D) Hendricks;
(E) Henry;
(F) Howard;
(G) Huntington;
(H) Jackson;
(I) Jasper;
(J) Jay;
(K) Jefferson;
(L) Jennings;
(M) Johnson;
(N) Knox;
(O) Kosciusko;
(P) LaGrange;
(Q) Lake;
(R) LaPorte;
(S) Lawrence;

(T) Madison;
(U) Marion;
(V) Marshall;
(W) Martin;
(X) Miami; and
(Y) Monroe;

in Indiana will be issued an approval within ninety (90) days of the receipt of all information required. The ninety (90) day period shall be suspended from the date that a notice of deficiency has been issued by the department to the owner, operator, or permittee, until receipt by the department of a complete and technically adequate response to the notice of deficiency.

(3) Any owner, operator, or permittee of an MSWLF located in the counties of:

(A) Montgomery;
(B) Morgan;
(C) Newton;
(D) Noble;
(E) Ohio;
(F) Orange;
(G) Owen;
(H) Parke;
(I) Perry;
(J) Pike;
(K) Porter;
(L) Posey;
(M) Pulaski;
(N) Putnam;
(O) Randolph;
(P) Ripley;
(Q) Rush;
(R) St. Joseph;
(S) Scott;
(T) Shelby;
(U) Spencer;
(V) Starke;
(W) Steuben;
(X) Sullivan;
(Y) Switzerland;
(Z) Tippecanoe;
(AA) Tipton;
(BB) Union;
(CC) Vanderburgh;
(DD) Vermillion;
(EE) Vigo;
(FF) Wabash;
(GG) Warren;
(HH) Warrick;
(II) Washington;
(JJ) Wayne;

329 IAC 10-10-2 Pending applications

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-14; IC 13-20; IC 36-9-30

Sec. 2. A permit application:

- (1) that is received on or before ~~June 21, 1995~~, the **date of preliminary adoption of this rule, as amended in 2002**, will not be required to be revised to meet the requirements of this article; however, the application must comply with 329 IAC 2, which was repealed in 1996, and applicable federal requirements; or
- (2) that is received after ~~June 21, 1995~~, the **date of preliminary adoption** will be required to comply with all applicable requirements of this article as effective on January 30, 2003.

329 IAC 10-11-2.1 Permit application requirements; general

Authority: IC 13-14-8-7; IC 13-15-2-1

Affected: IC 4-21.5-3-5; IC 13-14-11-3; IC 13-19-4; IC 13-20-21; IC 36-7-4; IC 36-9-30

Sec. 2.1. (a) An application for any solid waste land disposal facility permit, including renewals, or for

(KK) Wells;

(LL) White; and

(MM) Whitley;

in Indiana will be issued an approval within one hundred-twenty (120) days of receipt of all information required. The one hundred-twenty (120) day period shall be suspended from the date that a notice of deficiency has been issued by the department to the owner, operator, or permittee, until receipt by the department of a complete and technically adequate response to the notice of deficiency.

329 IAC 10-10-2 Pending applications

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-14; IC 13-20; IC 36-9-30

Sec. 2. ~~A permit application:~~

- ~~(1) that is received on or before June 21, 1995, will not be required to be revised to meet the requirements of this article; however, the application must comply with 329 IAC 2, which was repealed in 1996, and applicable federal requirements; or~~
- ~~(2) that is received after June 21, 1995, will be required to comply with all applicable requirements of this article.~~

An owner, operator or permittee of an MSWLF that is issued a permit for a new facility or a major modification on or after January 1, 2004, based upon an application received before that date, shall, within sixty (60) days following issuance of the permit for a new facility or a major modification submit the following:

- (1) any necessary permit modification application to comply with this article as amended on January 1, 2004, unless subdivision (2) is applicable.
- (2) all information for the agency's approval

which includes the SWP3 and associated information as required in 329 IAC 10-11-2.5(a)(10) through (13), 329 IAC 10-15-2(b)(10) and (11), 329 IAC 10-15-2(d)(4)(G) through (L), and 329 IAC 10-15-12. The submission must include all required information.

329 IAC 10-11-2.1 Permit application requirements; general

Authority: IC 13-14-8-7; IC 13-15-2-1

Affected: IC 4-21.5-3-5; IC 13-14-11-3; IC 13-19-4; IC 13-20-21; IC 36-7-4; IC 36-9-30

Sec. 2.1. (a) An application for any solid waste land disposal facility permit, including renewals, or for

a modification to a solid waste land disposal facility permit, excluding insignificant modifications, must be submitted to the commissioner on permit application forms provided by the commissioner, in a format specified by the commissioner. All narrative, plans, and other support documentation accompanying the application must also be submitted in a format specified by the commissioner.

(b) A complete application must include all of the following information:

- (1) The name and address of the applicant.
- (2) The name and address of the solid waste land disposal facility site.
- (3) The name and address of the solid waste land disposal facility owner, operator, or permittee if different from the real property owner.
- (4) The names and addresses of members of the board of county commissioners of a county that is affected by the permit application.
- (5) The names and addresses of the mayors of any cities that are affected by the permit application.
- (6) The names and addresses of the presidents of town councils of any towns that are affected by the permit application.
- (7) The legal description as defined in 329 IAC 10-2-104 for the following:
 - (A) The solid waste land disposal facility ~~boundaries:~~ **boundary**.
 - (B) If applicable, the solid waste boundary defining the area where the solid waste is to be deposited.
 - (C) Sufficient documentation must be provided to verify that the waste deposition area is located within the facility boundaries. Documentation must include a map of the legal description for these areas certified by a registered land surveyor.
- (8) Solid waste land disposal facility information, including the following:
 - (A) A description of the type of operation.
 - (B) The planned **or remaining** life of the solid waste land disposal facility in years.
 - (C) The expected ~~volume~~ **amount** of waste to be received in tons per operating day ~~and~~ **or** cubic yards per operating day.
 - (D) The type of waste to be received.
- (9) Signatures and certification statements in compliance with section 3 of this rule.
- (10) **Disclosure of all good character requirements as described in IC 13-19-4, except for a minor modification.**

a modification to a solid waste land disposal facility permit, excluding insignificant modifications, must be submitted to the commissioner on permit application forms provided by the commissioner, in a format specified by the commissioner. All narrative, plans, and other support documentation accompanying the application must also be submitted in a format specified by the commissioner.

(b) A complete application must include all of the following information:

- (1) The name and address of the applicant.
- (2) The name and address of the solid waste land disposal facility site.
- (3) The name and address of the solid waste land disposal facility owner, operator, or permittee if different from the real property owner.
- (4) The names and addresses of members of the board of county commissioners of a county that is affected by the permit application.
- (5) The names and addresses of the mayors of any cities that are affected by the permit application.
- (6) The names and addresses of the presidents of town councils of any towns that are affected by the permit application.
- (7) The legal description as defined in 329 IAC 10-2-104 for the following:
 - (A) The solid waste land disposal facility ~~boundaries:~~ **boundary**.
 - (B) If applicable, the solid waste boundary defining the area where the solid waste is to be deposited.
 - (C) Sufficient documentation must be provided to verify that the waste deposition area is located within the facility boundaries. Documentation must include a map of the legal description for these areas certified by a registered land surveyor.
- (8) Solid waste land disposal facility information, including the following:
 - (A) A description of the type of operation.
 - (B) The planned **or remaining** life of the solid waste land disposal facility in years.
 - (C) The expected ~~volume~~ **amount** of waste to be received in tons per operating day ~~and~~ **or** cubic yards per operating day.
 - (D) The type of waste to be received.
- (9) Signatures and certification statements in compliance with section 3 of this rule.
- (10) **Disclosure of all good character information as described in IC 13-19-4, unless the application is for a minor modification.**

(c) Five (5) copies of the completed application and all supporting documentation must be submitted to the commissioner as follows:

- (1) Sent by registered mail, ~~or~~ certified mail, **or private carrier** or delivered in person.
- (2) In addition to the paper copies, a copy of the completed application and all supporting documentation may be submitted ~~on digital media~~, **by electronic submission**, the type and format of which will be prescribed by the department.
- (3) Plans and documentation accompanying the application shall be submitted as required in 329 IAC 10-15-1(c).
- (4) **Documentation submitted to the department as required by this article may be in an electronic format as prescribed by the commissioner. Any documentation submitted in an electronic format also must be submitted as a paper copy or copies as required by this article.**

(d) Confidential treatment of information may be requested in accordance with ~~the rules of the solid waste management board~~ **329 IAC 6.1** for **all or a portion of** the permit application and supporting documents.

(e) All corporations must submit a copy of the certificate of existence signed by the secretary of state.

(f) Fees must be submitted with the application in accordance with IC 13-20-21.

329 IAC 10-11-2.5 Permit application for new land disposal facility and lateral expansions

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 4-21.5-3-5; IC 13-11-2-265; IC 13-14-11-3; IC 13-20-21; IC 14-4-5; IC 36-7-4; IC 36-9-30

Sec. 2.5. (a) In addition to the application requirements given at section 2.1 of this rule, a complete application for a solid waste land disposal facility permit or for a major modification of a solid waste land disposal facility permit for a lateral expansion must include all the following information:

- (1) Detailed plans and design specifications as required by:
 - (A) 329 IAC 10-15 through 329 IAC 10-19 and 329 IAC 10-22, as applicable;
 - (B) 329 IAC 10-24 through 329 IAC 10-27 and 329 IAC 10-30, as applicable; or
 - (C) 329 IAC 10-32 through 329 IAC 10-35 and 329 IAC 10-37, as applicable.
- (2) Closure and post-closure plans as required by:

(c) Five (5) copies of the completed application and all supporting documentation must be submitted to the commissioner as follows:

- (1) Sent by registered mail, ~~or~~ certified mail, **private carrier**, or delivered in person.
- (2) In addition to the paper copies, a copy of the completed application and all supporting documentation may be submitted ~~on digital media~~ **by electronic submission**, the type and format of which will be prescribed by the ~~department~~ **commissioner. The commissioner may make a determination that only an electronic copy is needed.**
- (3) Plans and documentation accompanying the application shall be submitted as required in 329 IAC 10-15-1(c).

(d) Confidential treatment of information may be requested in accordance with ~~the rules of the solid waste management board~~ **329 IAC 6.1** for **all or a portion of** the permit application and supporting ~~documents~~ **documentation**.

(e) All corporations must submit a copy of the certificate of existence signed by the secretary of state.

(f) Fees must be submitted with the application in accordance with IC 13-20-21.

329 IAC 10-11-2.5 Permit application for new land disposal facility and lateral expansions

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 4-21.5-3-5; IC 13-11-2-265; IC 13-14-11-3; IC 13-20-21; IC 14-4-5; IC 36-7-4; IC 36-9-30

Sec. 2.5. (a) In addition to the application requirements given at section 2.1 of this rule, a complete application for a solid waste land disposal facility permit or for a major modification of a solid waste land disposal facility permit for a lateral expansion must include all the following information:

- (1) Detailed plans and design specifications as required by:
 - (A) 329 IAC 10-15 through 329 IAC 10-19 and 329 IAC 10-22, as applicable;
 - (B) 329 IAC 10-24 through 329 IAC 10-27 and 329 IAC 10-30, as applicable; or
 - (C) 329 IAC 10-32 through 329 IAC 10-35 and 329 IAC 10-37, as applicable.
- (2) Closure and post-closure plans as required by:

- (A) 329 IAC 10-22-2 and 329 IAC 10-23-3, as applicable;
 - (B) 329 IAC 10-30-4 and 329 IAC 10-31-3, as applicable; or
 - (C) 329 IAC 10-37-4 and 329 IAC 10-38-3, as applicable.
- (3) The detailed plans and design specifications required by subdivision (1) and the closure and post-closure plans required by subdivision (2) must be certified by a registered professional engineer and must be properly titled.
- (4) A description of the financial instrument that will be used to achieve compliance with financial responsibility provisions of 329 IAC 10-39.
- (5) Documents necessary to establish ownership or other tenancy, such as an option to purchase, of the real estate upon which the solid waste land disposal facility to be permitted is located. The documentation must include a certified copy of the deed to the subject real estate showing ownership in the person identified as the owner in the application or the deed and evidence satisfactory to the commissioner that ownership will be transferred to the proper person for purposes of this rule, if not already done, prior to operation of the solid waste land disposal facility.
- (6) Documentation that proper zoning approvals have been obtained, including the following, if applicable:
- (A) A copy of the zoning requirements, if any, for solid waste facilities in the area where the solid waste land disposal facility is to be located.
 - (B) A copy of the improvement location permit or occupancy permit issued by the zoning authority having jurisdiction for the site, if a solid waste land disposal facility is permitted by the zoning ordinance in the area where the solid waste land disposal facility is to be located.
 - (C) A copy of the amendment to the zoning ordinance adopted under IC 36-7-4-901 et seq. if a change in the zone maps is required for the area where the solid waste land disposal facility is to be located.
 - (D) A copy of the amendment to the zoning ordinance adopted under IC 36-7-4-901 et seq. if such amendment is required for the area where the solid waste land disposal facility is to be located.
 - (E) A copy of the variance, special exception, special use, contingent use, or conditional use approved under IC 36-7-4-

- (A) 329 IAC 10-22-2 and 329 IAC 10-23-3, as applicable;
 - (B) 329 IAC 10-30-4 and 329 IAC 10-31-3, as applicable; or
 - (C) 329 IAC 10-37-4 and 329 IAC 10-38-3, as applicable.
- (3) The detailed plans and design specifications required by subdivision (1) and the closure and post-closure plans required by subdivision (2) must be certified by a registered professional engineer and must be properly titled.
- (4) A description of the financial instrument that will be used to achieve compliance with financial responsibility provisions of 329 IAC 10-39.
- (5) Documents necessary to establish ownership or other tenancy, such as an option to purchase, of the real estate upon which the solid waste land disposal facility to be permitted is located. The documentation must include a certified copy of the deed to the subject real estate showing ownership in the person identified as the owner in the application or the deed and evidence satisfactory to the commissioner that ownership will be transferred to the proper person for purposes of this rule, if not already done, prior to operation of the solid waste land disposal facility.
- (6) Documentation that proper zoning approvals have been obtained, including the following, if applicable:
- (A) A copy of the zoning requirements, if any, for solid waste facilities in the area where the solid waste land disposal facility is to be located.
 - (B) A copy of the improvement location permit or occupancy permit issued by the zoning authority having jurisdiction for the site, if a solid waste land disposal facility is permitted by the zoning ordinance in the area where the solid waste land disposal facility is to be located.
 - (C) A copy of the amendment to the zoning ordinance adopted under IC 36-7-4-901 et seq. if a change in the zone maps is required for the area where the solid waste land disposal facility is to be located.
 - (D) A copy of the amendment to the zoning ordinance adopted under IC 36-7-4-901 et seq. if such amendment is required for the area where the solid waste land disposal facility is to be located.
 - (E) A copy of the variance, special exception, special use, contingent use, or conditional use approved under IC 36-7-4-

921 et seq. if such approval is required for the area where the solid waste land disposal facility is to be located.

(F) The status of any appeal of any zoning determination as described in clauses (B) through (E), and if none is pending, the date by which the appeal must be initiated.

(7) A United States Geological Survey topographical quadrangle map seven and one-half (7½) minute, or equivalent, to include all areas within two (2) miles of the proposed facility boundaries with property boundaries and proposed solid waste boundaries clearly delineated.

(8) Documentation of the base flood elevation within one-fourth (¼) mile of the proposed facility boundaries. Either of the following forms of documentation are acceptable:

(A) A letter from the department of natural resources.

(B) A national flood insurance program map.

(9) A scaled map that depicts the following features, **(please note if none exist)**, which are known to the applicant or are discernable from public records, on and within one-half (½) mile of the proposed facility boundaries:

(A) Airports.

(B) Buildings.

(C) City, township, county, state, or national forests or parks.

(D) Coal borings.

(E) Culverts.

(F) Drainage tiles.

(G) Dwellings.

(H) Fault areas.

(I) Floodplains, **floodway fringes, and floodways.**

(J) Gas or oil wells.

(K) Hospitals.

(L) Legal drains.

(M) Nature preserves regulated under IC 14-4-5 [*IC 14-4 was repealed by P.L. 1-1995, SECTION 91, effective July 1, 1995.*] or **any** critical habitats ~~regulated under 50 CFR 17-~~ **as contained in 50 CFR 17.95 or 50 CFR 17.96.**

(N) Pipelines.

(O) Power lines.

(P) Roads.

(Q) Schools.

(R) Sewers.

(S) Sinkholes.

(T) Springs and seeps.

(U) Surface or underground mines.

921 et seq. if such approval is required for the area where the solid waste land disposal facility is to be located.

(F) The status of any appeal of any zoning determination as described in clauses (B) through (E), and if none is pending, the date by which the appeal must be initiated.

(7) A United States Geological Survey topographical quadrangle map seven and one-half (7½) minute, or equivalent, to include all areas within two (2) miles of the proposed facility boundaries with **real** property boundaries and proposed solid waste boundaries clearly delineated.

(8) Documentation of the base flood elevation within one-fourth (¼) mile of the proposed facility boundaries. Either of the following forms of documentation are acceptable:

(A) A letter from the department of natural resources.

(B) A national flood insurance program map.

(9) A scaled map that depicts the following features, which are known to the applicant or are discernable from public records, on and within one-half (½) mile of the proposed facility boundaries:

(A) Airports.

(B) Buildings.

(C) City, township, county, state, or national forests or parks.

(D) Coal borings.

(E) Culverts.

(F) Drainage tiles.

(G) Dwellings.

(H) Fault areas.

(I) Floodplains, **floodway fringes, and floodways.**

(J) Gas or oil wells.

(K) Hospitals.

(L) Legal drains.

(M) Nature preserves regulated under ~~IC 14-4-5~~ **IC 14-31-1** or **any** critical habitats ~~regulated under 50 CFR 17-~~ **as contained in 50 CFR 17.95 or 50 CFR 17.96, revised as of October 1, 2002.**

(N) Pipelines.

(O) Power lines.

(P) Roads.

(Q) Schools.

(R) Sewers.

(S) Sinkholes.

(T) Springs and seeps.

(U) Surface or underground mines.

- (V) Swamps.
- (W) Water courses or surface water, including reservoirs.
- (X) Wells.
- (Y) Wetlands.

(10) Potential areas where storm water may enter ground water, such as abandoned wells or sinkholes. Please note if none exist.

(11) Locations of specific points where storm water discharge will leave the facility boundary.

(12) Name of all receiving waters of the storm water discharge. If the discharge is to a separate municipal storm sewer, identify the name of the municipal operator and the ultimate receiving water of the storm water discharge.

~~(10)~~ **(13) A soil map and related description data as published by the United States Department of Agriculture, Natural Resources Conservation Service.**

(14) Current United States Geological Survey (USGS) hydrologic unit code (up to fourteen (14) digits).

~~(11)~~ **(15) Well logs and a topographic map indicating the location and identifying with respect to the drilling logs, all wells within one (1) mile of the proposed facility boundaries that are on file with the department of natural resources.**

~~(12)~~ **(16) A survey must be conducted for any residences or occupied buildings within one-fourth (1/4) of a mile of the proposed facility boundaries that do not have a well log. The survey is to determine whether wells that do not have well logs on file with the department of natural resources are present and obtain any information regarding these wells. A summary of the results of the survey and any information gained must be included with the application.**

~~(13)~~ **(17) The name and address of all owners or last taxpayers of record of property:**

- (A) located within one (1) mile of the proposed solid waste boundaries of a solid waste land disposal facility; and
- (B) of adjoining land that is within one-half (1/2) of a mile of the solid waste boundary.

~~(14)~~ **(18) A signed affidavit to the department agreeing to notify adjoining land owners as required in 329 IAC 10-12-1(b)(1).**

~~(15)~~ **(19) The following information relative to wetlands under 329 IAC 10-16-3 and other waters of the state: as defined under IC 13-11-2-265:**

- (A) A copy of the U.S. Army Corps of Engineers Section 404 of the Clean Water

- (V) Swamps.
- (W) Water courses or surface water, including reservoirs.
- (X) Wells.
- (Y) Wetlands.

Where any of these features do not exist, it should be noted either on the map or in an attached document.

(10) Locations where storm water may be directly discharged into ground water, such as abandoned wells or sinkholes. Please note if none exist.

(11) Locations of specific points where storm water discharge will leave the facility boundary.

(12) Names of all receiving waters. If the discharge is to a separate municipal storm sewer, identify the name of the municipal operator and the ultimate receiving water of the storm water discharge.

~~(10)~~ **(13) Identification of the regulated municipal separate storm sewer system entity receiving the storm water discharge, if applicable.**

(14) A soil map and related description data as published by the United States Department of Agriculture, Natural Resources Conservation Service.

(15) Current United States Geological Survey (USGS) hydrologic unit code (up to fourteen (14) digits).

~~(11)~~ **(16) Well logs and a topographic map indicating the location and identifying with respect to the drilling logs, all wells within one (1) mile of the proposed facility boundaries that are on file with the department of natural resources.**

~~(12)~~ **(17) A survey must be conducted for any residences or occupied buildings within one-fourth (1/4) of a mile of the proposed facility boundaries that do not have a well log. The survey is to determine whether wells that do not have well logs on file with the department of natural resources are present and obtain any information regarding these wells. A summary of the results of the survey and any information gained must be included with the application.**

~~(13)~~ **(18) The name and address of all owners or last taxpayers of record of property:**

- (A) located within one (1) mile of the proposed solid waste boundaries of a solid waste land disposal facility; and
- (B) of adjoining land that is within one-half (1/2) of a mile of the solid waste boundary.

Act permit and a copy of the Indiana department of environmental management Section 401 water quality certification or documentation acceptable to the department that a Section 404 and Section 401 water quality certification are not required.

(B) Any other mitigation plans required by any other government agency including permit conditions or restrictions placed on the siting of the solid waste land disposal facility in relationship to any other waters of the state as defined by 329 IAC 10-2-205. **under IC 13-11-2-265.**

(b) Restricted waste site Type III and construction/demolition landfills are exempt from submitting the information required in subsection (a)(9).

329 IAC 10-11-5.1 Renewal permit application

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20-21; IC 36-9-30

Sec. 5.1. (a) In addition to the application requirements given at section 2.1 of this rule, **excluding section 2.1(c)(3) of this rule**, a complete application for a renewal of a solid waste land disposal facility permit must include all the following information:

- (1) The name and address of all owners or last taxpayers of record of property of adjoining land that is within one-half (½) mile of the solid waste boundary.
- (2) The operation permit number of the solid waste land disposal facility.
- (3) The legal description of the solid number of acres permitted for waste land disposal. facility location as defined in 329 IAC 10-2-104.
- (4) Facility information, including the following:
 - (A) A description of the type of operation under 329 IAC 10-9-1.
 - (B) The number of acres permitted for waste disposal.
 - (C) The remaining life of the solid waste land disposal facility in years.
 - (D) The volume of waste received at the

~~(14)~~ (19) A signed affidavit to the department agreeing to notify adjoining land owners as required in 329 IAC 10-12-1(b)(1).

~~(15)~~ (20) The following information relative to wetlands under 329 IAC 10-16-3 and other waters, of the state: **defined under IC 13-11-2-265:**

(A) A copy of the U.S. Army Corps of Engineers Section 404 of the Clean Water Act permit and a copy of the Indiana department of environmental management Section 401 water quality certification or documentation acceptable to the department that a Section 404 permit and Section 401 water quality certification are not required.

(B) Any other mitigation plans required by any other government agency including permit conditions or restrictions placed on the siting of the solid waste land disposal facility in relationship to any other waters, of the state as defined by 329 IAC 10-2-205. **under IC 13-11-2-265.**

(b) Restricted waste site Type III and construction/demolition landfills are exempt from submitting the information required in subsection (a)(9).

329 IAC 10-11-5.1 Renewal permit application

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20-21; IC 36-9-30

Sec. 5.1. (a) In addition to the application requirements given at section 2.1 of this rule, **excluding subdivision 2.1(c)(3) of this rule**, a complete application for a renewal of a solid waste land disposal facility permit must include all the following information:

- (1) The name and address of all owners or last taxpayers of record of property of adjoining land that is within one-half (½) mile of the solid waste boundary.
- (2) The operation permit number of the solid waste land disposal facility.
- (3) The legal description of the solid number of acres permitted for waste land disposal. facility location as defined in 329 IAC 10-2-104.
- (4) Facility information, including the following:
 - (A) A description of the type of operation under 329 IAC 10-9-1.
 - (B) The number of acres permitted for waste disposal.
 - (C) The remaining life of the solid waste land disposal facility in years.

solid waste land disposal facility in cubic yards per operating day or tons per operating day.

~~(E) The type of waste received at the solid waste land disposal facility.~~

~~(5)~~ **(4)** A topographic plot plan that reflects the current condition of the solid waste land disposal facility and current elevations taken within ~~six (6)~~ **twelve (12)** months of the submittal of the application and accurately identifying the following information to a scale as required by 329 IAC 10-15-2(a), 329 IAC 10-24-2(a), or 329 IAC 10-32-2(a):

(A) Areas of final cover, grading, and seeding.

(B) Filled areas lacking final cover, grading, and seeding.

(C) Current areas of operation, including depth of waste fill.

(D) Projected solid waste disposal areas on a per year basis for the next five (5) years.

~~(6) Signatures and certification statements in compliance with section 3 of this rule.~~

(5) A copy of the latest approved final contour plot plan with scale, as required by 329 IAC 10-15-2(a).

(6) A copy of the latest approved subgrade contours or the uppermost contour of the soil liner.

(b) An application for a renewal of a solid waste land disposal facility permit must be submitted at least one hundred twenty (120) days prior to the expiration date of the permit or the permit will be invalid upon expiration.

(c) Fees must be submitted with the application in accordance with IC 13-20-21.

329 IAC 10-11-6 Minor modification applications

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3; IC 13-20-1
Affected: IC 13-20-1; IC 13-21-5; IC 36-9-30

Sec. 6. (a) In addition to the application requirements given at section 2.1 of this rule, ~~for a minor modification of a solid waste facility permit, excluding section 2.1(b)(10) of this rule~~, adequate information must be included in an application for a minor modification of a solid waste land disposal facility permit to demonstrate that the minor modification will be protective of human health and the environment. The commissioner shall determine the

~~(D) The volume of waste received at the solid waste land disposal facility in cubic yards per operating day or tons per operating day.~~

~~(E) The type of waste received at the solid waste land disposal facility.~~

~~(5)~~ **(4)** A topographic plot plan that reflects the current condition of the solid waste land disposal facility and current elevations taken within ~~six (6)~~ **twelve (12)** months of the submittal of the application and accurately ~~identifying~~ **identifies** the following information to a scale as required by 329 IAC 10-15-2(a), 329 IAC 10-24-2(a), or 329 IAC 10-32-2(a):

(A) Areas of final cover, **including certified closed area, and type of final cover** ~~grading, and seeding.~~

(B) Filled areas lacking final cover, grading, and seeding.

(C) Current areas of operation, ~~including depth of waste fill.~~

(D) Projected solid waste disposal areas on a per year basis for the next five (5) years.

~~(6) Signatures and certification statements in compliance with section 3 of this rule.~~

(5) A copy of the latest approved final contour plot plan with scale, as required by 329 IAC 10-15-2(a).

(6) A copy of the latest approved subgrade contours or the uppermost contour of the soil liner.

(b) An application for a renewal of a solid waste land disposal facility permit must be submitted at least one hundred twenty (120) days prior to the expiration date of the permit or the permit will be invalid upon expiration.

(c) Fees must be submitted with the application in accordance with IC 13-20-21.

329 IAC 10-11-6 Minor modification applications

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3; IC 13-20-1
Affected: IC 13-20-1; IC 13-21-5; IC 36-9-30

Sec. 6. (a) In addition to the application requirements given at section 2.1 of this rule, ~~for a minor modification of a solid waste facility permit, excluding section 2.1(b)(10) of this rule~~, adequate information must be included in an application for a minor modification of a solid waste land disposal facility permit to demonstrate that the minor modification will be protective of human health and the environment. The commissioner shall determine the

information adequate based on the type of minor modification requested by the facility.

(b) In addition to any requirements in subsection (a), the application must also include the name and address of all owners or last taxpayers of record of property of adjoining land that is within one-half (½) mile of the solid waste boundary.

(c) Fees must be submitted with the application in accordance with IC 13-20-21.

(d) Borrow pits owned by the facility and not permitted by the department on the latest effective date of this section, must be included in the facility permit through application for minor modification on application forms provided by the commissioner. This requirement only includes a borrow pit:

- (1) owned by the facility;
- (2) not previously permitted by the department on the latest effective date of this section; and
- (3) located on-site or on property adjoining the facility.

329 IAC 10-12-1 Public process for new solid waste land disposal facility permits; major permit modifications; minor permit modifications

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3; IC 13-20-1
Affected: IC 5-3-1-2; IC 5-3-1-6; IC 5-3-2; IC 13-15-3-3; IC 13-20; IC 36-9-30

Sec. 1. (a) A person submitting an affidavit as required by ~~329 IAC 10-11-2.5(a)(13)~~ **329 IAC 10-11-2.5(a)(20)** and an application for one (1) of the following shall make notice as required in subsection (b):

- (1) A new solid waste land disposal facility permit.
- (2) A major modification for a lateral expansion permit **or a vertical expansion permit.**
- (3) A minor modification permit ~~under 329 IAC 10-2-112(a)(2):~~ **for a lateral expansion that would not:**

(A) increase the facility's permitted capacity to dispose of solid waste by the lesser of:

- (i) more than ten percent (10%); or
- (ii) five hundred thousand (500,000) cubic yards; or

(B) in a lateral expansion, increase the area within the permitted solid waste boundary by more than one (1) acre.

information adequate based on the type of minor modification requested by the facility.

(b) In addition to ~~any~~ **the** requirements in subsection (a), the application must also include the name and address of all owners or last taxpayers of record of property of adjoining land that is within one-half (½) mile of the solid waste boundary.

(c) Fees must be submitted with the application in accordance with IC 13-20-21.

(d) Borrow pits owned by the owner, operator, or permittee and not permitted by the department before January 1, 2004, must be included in the facility permit through application for minor modification on application forms provided by the commissioner. This requirement includes a borrow pit:

- (1) owned by the owner, operator, or permittee;
- (2) not permitted by the department before January 1, 2004; and
- (3) located on-site or on property adjoining the facility.

329 IAC 10-12-1 Public process for new solid waste land disposal facility permits; major permit modifications; minor permit modifications

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3; IC 13-20-1
Affected: IC 5-3-1-2; IC 5-3-1-6; IC 5-3-2; IC 13-15-3-3; IC 13-20; IC 36-9-30

Sec. 1. (a) A person submitting ~~an affidavit as required by 329 IAC 10-11-2.5(a)(13)~~ **an affidavit as required by 329 IAC 10-11-2.5(a)(19)** and an application for one (1) of the following shall **submit an affidavit as required by 329 IAC 10-11-2.5(a)(19)** and shall make notice as required in subsection (b):

- (1) A new solid waste land disposal facility permit.
- (2) A major modification for a lateral expansion permit **or a vertical expansion permit.**
- (3) A minor modification permit ~~under 329 IAC 10-2-112(a)(2):~~ **for an acreage expansion that would not:**

(A) increase the facility's permitted capacity to dispose of solid waste by the lesser of:

- (i) more than ten percent (10%); or
- (ii) five hundred thousand (500,000) cubic yards; or

(B) in an acreage expansion, increase the area within the permitted solid waste boundary by more than one (1) acre.

(b) The notice required by subsection (a) must include the following:

(1) Not more than ten (10) working days after submitting an application, an applicant shall make a reasonable effort to notify the owners of record of adjoining land to the solid waste land disposal facility or proposed solid waste land disposal facility.

(2) The notice provided by the applicant in this subsection must:

- (A) be in writing;
- (B) include the date on which the application for the permit was submitted to the department; and
- (C) include a brief description of the subject of the application.

(c) A public meeting must be conducted by the applicant submitting an application for the following:

- (1) A new solid waste land disposal facility permit.
- (2) A major modification to a solid waste land disposal facility permit.

(d) The applicant shall complete the following for the public meeting **as** required in subsection (c):

(1) Within sixty (60) days after the date the applicant received notification from the commissioner that the application has been deemed complete, conduct a public meeting in the county where the solid waste land disposal facility or major modification designated in the application **is will be** located.

(2) Publish notice of the public meeting **required in subdivision (1)** at least ten (10) days prior to the meeting in a newspaper of general circulation in the county where the solid waste land disposal facility or major modification will be located. The notice must:

- (A) be at least two (2) columns wide by five (5) inches long;
- (B) not be placed in the part of the newspaper where the legal notices and classified advertisements appear;
- (C) include the time and date of the public meeting;
- (D) state the exact place of the public meeting; and
- (E) have every effort made by the applicant and the department to coordinate the publication date of the notice of the public meeting held by the applicant as required by this subdivision with the publication date of the notice of public hearing held by the

(b) The notice required by subsection (a) must include the following:

(1) Not more than ten (10) working days after submitting an application, an applicant shall make a reasonable effort to notify the owners of record of adjoining land to the solid waste land disposal facility or proposed solid waste land disposal facility.

(2) The notice provided by the applicant in this subsection must:

- (A) be in writing;
- (B) include the date on which the application for the permit was submitted to the department; and
- (C) include a brief description of the subject of the application.

(c) A public meeting must be conducted by the applicant submitting an application for the following:

- (1) A new solid waste land disposal facility permit.
- (2) A major modification to a solid waste land disposal facility permit.

(d) The applicant shall complete the following for the public meeting **as** required in subsection (c):

(1) Within sixty (60) days after the date the applicant received notification from the commissioner that the application has been deemed complete, conduct a public meeting in the county where the solid waste land disposal facility or major modification designated in the application **is will be** located.

(2) Publish notice of the public meeting **required in subdivision (1)** at least ten (10) days prior to the meeting in a newspaper of general circulation in the county where the solid waste land disposal facility or major modification will be located. The notice must:

- (A) be at least two (2) columns wide by five (5) inches long;
- (B) not be placed in the part of the newspaper where the legal notices and classified advertisements appear;
- (C) include the time and date of the public meeting;
- (D) state the exact place of the public meeting; and
- (E) have every effort made by the applicant and the department to coordinate the publication date of the notice of the public meeting held by the applicant as required by this subdivision with the publication date of

- department as required in subsection (i)(1).
- (3) Conduct the public meeting as follows:
- (A) Present a brief description of the location and operation of the proposed solid waste land disposal facility or major modification.
 - (B) Indicate where copies of the application have been filed.
 - (C) If the applicant proposes a design alternative, the applicant must briefly describe the alternative design.
 - (D) State that the department will accept written comments and questions from the public on the permit application and announce the address of the department and name of the person accepting comments on behalf of the department.
 - (E) Provide fact sheets on the proposed solid waste land disposal facility or major modification that have been prepared by the department for the public. A department representative shall attend the meeting.
 - (F) Offer the opportunity for public comments and questions.

(e) Within five (5) days after the date the applicant received notification from the commissioner that the application has been deemed complete by the department, the applicant shall place a copy of the complete application and any additional information that the department requests at a library in the county where the solid waste land disposal facility or major modification will be located.

(f) The applicant shall pay the costs of complying with subsections (c) through (e).

(g) Failure of the applicant to comply with subsections (c) through (f) may result in the denial of the application by the department.

(h) Public notice must be made by the department as required by IC 5-3-1-2(h) after the date the applicant received notification from the commissioner that the permit application is deemed completed. The public notice must meet the following requirements:

- (1) Indicate where copies of the application are available for public review.
- (2) State that the department will accept comments from the public on the application for at least thirty (30) days.
- (3) Offer the opportunity for a public hearing on the application.
- (4) The department shall publish the notice in

the notice of public hearing held by the department as required in subsection (i)(1).

- (3) Conduct the public meeting as follows:
- (A) Present a brief description of the location and operation of the proposed solid waste land disposal facility or major modification.
 - (B) Indicate where copies of the application have been filed.
 - (C) If the applicant proposes a design alternative, the applicant must briefly describe the alternative design.
 - (D) State that the department will accept written comments and questions from the public on the permit application and announce the address of the department and name of the person accepting comments on behalf of the department.
 - (E) Provide fact sheets on the proposed solid waste land disposal facility or major modification that have been prepared by the department for the public. A department representative shall attend the meeting.
 - (F) Offer the opportunity for public comments and questions.

(e) Within five (5) days after the date the applicant received notification from the commissioner that the application has been deemed complete by the department, the applicant shall place a copy of the complete application and any additional information that the department requests at a library in the county where the solid waste land disposal facility or major modification will be located.

(f) The applicant shall pay the costs of complying with subsections (c) through (e).

(g) Failure of the applicant to comply with subsections (c) through (f) may result in the denial of

the application by the department.

(h) Public notice must be made by the department as required by IC 5-3-1-2(h)(i) after the date the applicant received notification from the commissioner that the permit application is deemed completed. The public notice must meet the following requirements:

- (1) Indicate where copies of the application are available for public review.
- (2) State that the department will accept comments from the public on the application for at least thirty (30) days.

accordance with IC 5-3-1-6.

(5) If the facility boundary of the proposed solid waste land disposal facility or major modification, if also a lateral expansion, will be within one (1) mile of the county boundary, the department will publish the notice in accordance with IC 5-3-1-6 in the adjacent county.

(6) In addition to the requirements in IC 5-3-1-6, the department shall publish the notice in two (2) newspapers in the county where the solid waste land disposal facility or major modification is located, if there are two (2) newspapers of general circulation in the county.

(i) The department shall hold a public hearing ~~as if~~ required by IC 13-15-3-3. The following apply to a public hearing:

(1) The department shall publish notice of the hearing as required in IC 5-3-1 and IC 5-3-2 in newspapers of general circulation in the county where the solid waste land disposal facility (if a major modification) or proposed solid waste land disposal facility is located.

(2) During a hearing, a person may testify within the time provided or submit written comments, or both. The department will consider testimony that is relevant to the requirements of IC 13 and this article.

329 IAC 10-13-1 Issuance procedures; original permits

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-11; IC 13-12; IC 13-13; IC 13-14-8; IC 13-16; IC 13-17; IC 13-19; IC 13-20; IC 13-21; IC 13-22; IC 13-23; IC 13-24; IC 13-25; IC 13-26; IC 13-27; IC 13-27.5; IC 13-29; IC 13-30-2; IC 36-9-30

Sec. 1. (a) The department shall comply with the procedural requirements of IC 13-15-3, IC 13-15-5, and IC 13-15-6 pertaining to public notice, public comment, and public hearing for an application for ~~an~~ **original** a permit for a solid waste land disposal facility regulated under IC 13-19-3.

(b) Subject to the provision of 329 IAC 10-11-1(c), if the department determines that the permit application meets the requirements of this article, and that the solid waste land disposal facility will be constructed and operated in accordance with the requirements of this article and the applicant is otherwise in compliance with the environmental

(3) Offer the opportunity for a public hearing on the application.

(4) The department shall publish the notice in accordance with IC 5-3-1-6.

(5) If the facility boundary of the proposed solid waste land disposal facility ~~is~~ or major modification, if also a lateral expansion, will be within one (1) mile of the county boundary, the department will publish the notice in accordance with IC 5-3-1-6 in the adjacent county.

(6) In addition to the requirements in IC 5-3-1-6, the department shall publish the notice in two (2) newspapers in the county where the solid waste land disposal facility or major modification is located, if there are two (2) newspapers of general circulation in the county.

(i) The department shall hold a public hearing ~~as if~~ required by IC 13-15-3-3. The following apply to a public hearing:

(1) The department shall publish notice of the hearing as required in IC 5-3-1 and IC 5-3-2 in newspapers of general circulation in the county where the solid waste land disposal facility (if a major modification) or proposed solid waste land disposal facility is located.

(2) During a hearing, a person may testify within the time provided or submit written comments, or both. The department will consider testimony that is relevant to the requirements of IC 13 and this article.

329 IAC 10-13-1 Issuance procedures; original permits

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-11; IC 13-12; IC 13-13; IC 13-14-8; IC 13-16; IC 13-17; IC 13-19; IC 13-20; IC 13-21; IC 13-22; IC 13-23; IC 13-24; IC 13-25; IC 13-26; IC 13-27; IC 13-27.5; IC 13-29; IC 13-30-2; IC 36-9-30

Sec. 1. (a) The department shall comply with the procedural requirements of IC 13-15-3, IC 13-15-5, and IC 13-15-6 pertaining to public notice, public comment, and public hearing for an application for ~~an~~ **original** a permit for a solid waste land disposal facility regulated under IC 13-19-3.

(b) Subject to the provision of 329 IAC 10-11-1(c), if the department determines that the permit application meets the requirements of this article, and that the solid waste land disposal facility will be constructed and operated in accordance with the requirements of this article and the applicant is otherwise in compliance with the environmental

statutes of Indiana, the permit will be granted. The department may impose such conditions in a permit as may be necessary to:

- (1) comply with the requirements of this article, IC 13-11 through IC 13-30, and IC 36-9-30; or
- (2) protect the public health ~~and~~ or the environment.

(c) The notice of the granting of a permit must state that the permit will not become effective until ~~(1) all financial responsibility documents have been executed and delivered to the department in the form and amount specified; and~~ (2) the completion and execution of any real estate transfers necessary to vest legal title of the real estate upon which the permitted activity is to occur in the name of the owner listed on the application have been completed, executed, and such documentation necessary to evidence such transfer has been recorded and delivered to the department, or proof of the applicant's agreement regarding the leasing of this property has been submitted to the department.

(d) Notwithstanding subsection (c), a variance granted under IC 13-14-8 must not be transferred to another person without independent proof of undue hardship or burden by the person seeking transfer.

329 IAC 10-13-5 Transferability of permits

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-15-7; IC 13-30-6; IC 36-9-30-35

Sec. 5. (a) A permit may be transferred to a third person by the permittee without the need for a new permit or modification or revocation of the existing permit being required if:

- (1) the permittee notifies the commissioner of the proposed transfer at least sixty (60) days before the proposed date of transfer on forms provided by the commissioner;
- (2) a written contract between the permittee and the third person containing a specific date of transfer of permit responsibility is submitted to the commissioner;
- (3) the transferee has not been convicted under IC 13-30-6 or IC 36-9-30-35;
- (4) the commissioner has not revoked under IC 13-15-7 a permit to the transferee that was issued under:
 - (A) this article;
 - (B) 329 IAC 1.5, which was repealed in 1989; or
 - (C) 329 IAC 2, which was repealed in 1996;

statutes of Indiana, the permit will be granted. The department may impose such conditions in a permit as may be necessary to:

- (1) comply with the requirements of this article, IC 13-11 through IC 13-30, and IC 36-9-30; or
- (2) protect the public health and the environment.

(c) The notice of the granting of a permit must state that the permit will not become effective until ~~(1) all financial responsibility documents have been executed and delivered to the department in the form and amount specified; and~~ (2) the completion and execution of any real estate transfers necessary to vest legal title of the real estate upon which the permitted activity is to occur in the name of the owner listed on the application have been completed, executed, and such documentation necessary to evidence such transfer has been recorded and delivered to the department, or proof of the applicant's agreement regarding the leasing of this property has been submitted to the department.

~~(d) Notwithstanding subsection (c), a variance granted under IC 13-14-8 must not be transferred to another person without independent proof of undue hardship or burden by the person seeking transfer.~~

329 IAC 10-13-5 Transferability of permits

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-15-7; IC 13-30-6; IC 36-9-30-35

Sec. 5. (a) A permit may be transferred to a third person by the permittee without the need for a new permit or modification or revocation of the existing permit being required if:

- (1) the permittee notifies the commissioner of the proposed transfer at least sixty (60) days before the proposed date of transfer on forms provided by the commissioner;
- (2) a written contract between the permittee and the third person containing a specific date of transfer of permit responsibility is submitted to the commissioner;
- (3) the transferee has not been convicted under IC 13-30-6 or IC 36-9-30-35;
- (4) the commissioner has not revoked under IC 13-15-7 a permit to the transferee that was issued under:
 - (A) this article;
 - (B) 329 IAC 1.5, which was repealed in 1989; or
 - (C) 329 IAC 2, which was repealed in 1996;

(5) the third person is, at the time of the application or permit decision, in compliance with the Environmental Protection Acts and ~~regulations~~ **rules** promulgated thereunder and does not have a history of repeated violations of the Acts or ~~regulations~~ **rules** or material permit conditions that evidence an inability or unwillingness to comply with requirements of this article or a facility permit;

(6) the transferee provides proof **to the department** of financial responsibility under 329 IAC 10-39; and

(7) the transferee provides proof **to the department** that ~~it the transferee~~ is, or will be, the owner of the real property or provides proof of the applicant's agreement regarding the leasing of the property. ~~to the department.~~

(b) The transfer will be effective on the specific date of transfer provided by the permittee unless the commissioner notifies the permittee and the transferee that the transfer will be denied.

(c) Notwithstanding the transfer of a permit, a variance must not be transferred to another person.

329 IAC 10-14-1 Quarterly reports

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 24-6; IC 36-9-30

Sec. 1. (a) A quarterly tonnage report of solid waste received at the solid waste land disposal facility must be submitted to the commissioner by the owner, operator, or permittee of that facility.

(b) The report required by subsection (a) must be submitted on or before the fifteenth day of the month immediately following the end of the calendar quarter being reported. If the submittal date falls on a Saturday, a Sunday, or a national or state legal holiday, the submittal date will be the next day that is not a Saturday, a Sunday, or a national or state legal holiday.

(c) The report required by subsection (a) must be submitted by the owner, operator, or permittee of the solid waste land disposal facility that is open to accept solid waste for disposal unless the owner, operator, or permittee of the solid waste land disposal facility has ceased accepting solid waste for a period of at least one (1) calendar quarter, and has sent written notification to the commissioner indicating the initiation of final

(5) the third person is, at the time of the application or permit decision, in compliance with the Environmental Protection Acts and ~~regulations~~ **rules** promulgated thereunder and does not have a history of repeated violations of the Acts or ~~regulations~~ **rules** or material permit conditions that evidence an inability or unwillingness to comply with requirements of this article or a facility permit;

(6) the transferee provides proof **to the department** of financial responsibility under 329 IAC 10-39; and

(7) the transferee provides proof **to the department** that ~~it the transferee~~ is, or will be, the owner of the real property or provides proof of the applicant's agreement regarding the leasing of the property. ~~to the department.~~

(b) The transfer will be effective on the specific date of transfer provided by the permittee unless the commissioner notifies the permittee and the transferee that the transfer will be denied.

(c) Notwithstanding ~~the transfer of a permit~~ **subsection (a)(1), a variance granted under IC 13-14-8** must not be transferred to another person **without independent proof of undue hardship or burden by the person seeking transfer.**

329 IAC 10-14-1 Quarterly reports

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 24-6; IC 36-9-30

Sec. 1. (a) A quarterly tonnage report of solid waste received at the solid waste land disposal facility must be submitted to the commissioner by the owner, operator, or permittee of that facility.

(b) The report required by subsection (a) must be submitted on or before the fifteenth day of the month immediately following the end of the calendar quarter being reported. If the submittal date falls on a Saturday, a Sunday, or a national or state legal holiday, the submittal date will be the next day that is not a Saturday, a Sunday, or a national or state legal holiday.

(c) The report required by subsection (a) must be submitted by the owner, operator, or permittee of the solid waste land disposal facility that is open to accept solid waste for disposal unless the owner, operator, or permittee of the solid waste land disposal facility has ceased accepting solid waste for a period of at least one (1) calendar quarter, and has sent written notification to the commissioner indicating the initiation of final

closure under 329 IAC 10-22-4, 329 IAC 10-30-6, or 329 IAC 10-37-6 as appropriate.

(d) The solid waste hauler shall provide the owner, operator, or permittee of the solid waste land disposal facility with the origin of the solid waste delivered to the solid waste land disposal facility. The hauler shall estimate, by percent, the type and amount of solid waste originating in each county and state, or country if other than the United States, if the load contains solid waste from more than one (1) county, state, or country.

(e) The owner, operator, or permittee of the solid waste land disposal facility shall submit the quarterly tonnage report required by subsection (a) as follows:

(1) ~~On~~ **In** the most current paper ~~report form or~~ **electronic submittal format** prescribed by the ~~department~~ **commissioner**. The owner, operator, or permittee may obtain a quarterly tonnage report form from the department. The form:

- (A) may be photocopied **or electronically copied** by the owner, operator, or permittee of the solid waste land disposal facility; and
- (B) in its most current format, may be computer generated by the owner, operator, or permittee of the solid waste land disposal facility.

(2) The original of each paper report must be signed by the solid waste land disposal facility owner, operator, or permittee as certification of report accuracy.

(3) Each report must be accurate, legible, and complete.

(4) ~~One (1) additional paper copy of each original paper report must be submitted with the original paper report required in subdivision (6):~~

(5) ~~In addition to the paper report required in subdivision (1); an electronic report in a format approved by the commissioner may also be submitted:~~

(6) ~~(4)The paper report and any approved format required by this subsection must~~ **meet the requirements of 329 IAC 10-1-4, as applicable, and must** include at least the following information:

- (A) The weight in total tons of solid waste received at the solid waste land disposal facility for that calendar quarter compiled by waste type and origin.
- (B) The county and state in which the solid waste originated. If the solid waste originated outside of the United States, the country must be designated. The origin must be provided to the solid waste land disposal

closure under 329 IAC 10-22-4, 329 IAC 10-30-6, or 329 IAC 10-37-6 as appropriate.

(d) The solid waste hauler shall provide the owner, operator, or permittee of the solid waste land disposal facility with the origin of the solid waste delivered to the solid waste land disposal facility. The hauler shall estimate, by percent, the type and amount of solid waste originating in each county and state, or country if other than the United States, if the load contains solid waste from more than one (1) county, state, or country.

(e) The owner, operator, or permittee of the solid waste land disposal facility shall submit the quarterly tonnage report required by subsection (a) as follows:

(1) ~~On~~ **In** the most current paper ~~report form or~~ **electronic submittal format** prescribed by the ~~department~~ **commissioner**. The owner, operator, or permittee may obtain a quarterly tonnage report form from the department. The form:

- (A) may be photocopied **or electronically copied** by the owner, operator, or permittee of the solid waste land disposal facility; and
- (B) in its most current format, may be computer generated by the owner, operator, or permittee of the solid waste land disposal facility.

(2) The original of each paper report must be signed by the solid waste land disposal facility owner, operator, or permittee as certification of report accuracy.

(3) Each report must be accurate, legible, and complete.

(4) ~~One (1) additional paper copy of each original paper report must be submitted with the original paper report required in subdivision (6):~~

(5) ~~In addition to the paper report required in subdivision (1); an electronic report in a format approved by the commissioner may also be submitted:~~

(6) ~~(4)The paper report and any approved format required by this subsection must include at least the following information:~~

- (A) The weight in total tons of solid waste received at the solid waste land disposal facility for that calendar quarter compiled by waste type and origin.
- (B) The county and state in which the solid waste originated. If the solid waste originated outside of the United States, the country must be designated. The origin must be provided to the solid waste land disposal facility by the solid waste hauler as described in subsection (d).

facility by the solid waste hauler as described in subsection (d).

(C) The type, total weight in tons, and final destination of solid waste diverted from disposal for reuse or recycling after being received at the solid waste land disposal facility.

~~(D)~~ The estimated remaining disposal capacity, in cubic yards, that is calculated by subtracting the existing fill volume as determined by the contour map required by 329 IAC 10-20-8(a)(6) from the design capacity.

~~(E)~~ The estimated remaining solid waste land disposal facility life, in years, for the remaining disposal capacity.

~~(F)~~ **(D)** Waste types, including the following:

- (i) Municipal solid waste.
- (ii) Construction/demolition waste.
- (iii) **Special Foundry** waste.
- (iv) **Coal ash.**

(v) Flue gas desulfurization wastes.

(vi) Other solid waste.

(f) If the owner, operator, or permittee of the solid waste land disposal facility ascertains that there is an error in any report previously submitted as required by subsection (a), a revised report reflecting the correct information must be submitted in the same format as the original submission. The revised report must:

- (1) have "Amended" written or typed at the top of each page of the resubmitted report; and
- (2) be submitted before or with the submission of the next quarterly tonnage report after ascertaining an error.

(g) Copies of reports required by this section must be:

- (1) maintained on-site by the solid waste land disposal facility owner, operator, or permittee for three (3) years after the submittal date of the report; and
- (2) made available during normal operating hours for ~~on-site~~ inspection and photocopying **or electronic copying** by a representative of the department.

(h) The solid waste land disposal facility owner, operator, or permittee shall maintain the documentation ~~on-site~~ to substantiate reports required by this section. Such documentation must be:

- (1) maintained by the solid waste land disposal facility owner, operator, or permittee for three (3)

(C) The type, total weight in tons, and final destination of solid waste diverted from disposal for reuse or recycling after being received at the solid waste land disposal facility.

~~(D)~~ The estimated remaining disposal capacity, in cubic yards, that is calculated by subtracting the existing fill volume as determined by the contour map required by 329 IAC 10-20-8(a)(6) from the design capacity.

~~(E)~~ The estimated remaining solid waste land disposal facility life, in years, for the remaining disposal capacity.

~~(F)~~ **(D)** Waste types, including the following:

- (i) Municipal solid waste.
- (ii) Construction/demolition waste.
- (iii) **Special Foundry** waste.
- (iv) **Coal ash.**

(v) Flue gas desulfurization wastes.

(vi) Other solid waste.

(f) If the owner, operator, or permittee of the solid waste land disposal facility ascertains that there is an error in any report previously submitted as required by subsection (a), a revised report reflecting the correct information must be submitted in the same format as the original submission. The revised report must:

- (1) have "Amended" written or typed at the top of each page of the resubmitted report; and
- (2) be submitted before or with the submission of the next quarterly tonnage report after ascertaining an error.

(g) Copies of reports required by this section must be:

- (1) ~~maintained on-site by the solid waste land disposal facility owner, operator, or permittee~~ **retained as specified under 329 IAC 10-1-4(b)** for three (3) years after the submittal date of the report; and
- (2) made available during normal operating hours for ~~on-site~~ inspection and photocopying **or electronic copying** by a representative of the department.

(h) The solid waste land disposal facility owner, operator, or permittee shall maintain the documentation ~~on-site~~ to substantiate reports required by this section. Such documentation must be:

- (1) ~~maintained by the solid waste land disposal facility owner, operator, or permittee~~ **retained as specified under 329 IAC 10-1-4(b)** for three (3)

years after the ~~report's~~ submittal date; and
(2) made available during normal operating hours for ~~on-site~~ inspection and photocopying **or electronic copying** by a representative of the department.

(i) Failure to submit reports and copies as required by this section or maintain copies of reports and records as required by this section constitutes an operational violation under 329 IAC 10-1-2.

329 IAC 10-15-1 General requirements

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 25-17.6-1-6.5; IC 36-9-30

Sec. 1. (a) A permit application for a new MSWLF or a lateral expansion must be accompanied by the following plans and documentation:

- (1) Plot plans as specified under section 2 of this rule.
- (2) Cross-sectional drawings and details as specified under section 3 of this rule.
- (3) A hydrogeologic site investigation report as specified under sections 4 and 5 of this rule.
- (4) An operational plan of the proposed MSWLF as specified under section 6 of this rule.
- (5) A CQA/CQC plan as specified under section 7 of this rule.
- (6) Calculations and analyses pertaining to MSWLF design as specified under section 8 of this rule.
- (7) An explosive gas management plan as specified under 329 IAC 10-20-17.
- (8) A closure plan as specified under 329 IAC 10-22-2.
- (9) A post-closure plan, as specified under 329 IAC 10-23-3.
- (10) A quality assurance project plan as specified under 329 IAC 10-21-2(b)(13).
- (11) A sampling and analysis plan as specified under 329 IAC 10-21-2.
- (12) A general description for developing a statistical evaluation plan as required by 329 IAC 10-21-6(c). The description must include a time frame for submitting the statistical evaluation plan.
- (13) If applicable, a baled waste management plan as specified under section 9 of this rule.
- (14) A leak detection plan as specified under section 10 of this rule.
- (15) A leachate collection contingency plan as specified under section 11 of this rule.
- (16) A storm water pollution prevention plan as**

years after the ~~report's~~ submittal date **of the report**; and
(2) made available during normal operating hours for ~~on-site~~ inspection and photocopying **or electronic copying** by a representative of the department.

(i) Failure to submit reports and copies as required by this section or maintain copies of reports and records as required by this section constitutes an operational violation ~~under 329 IAC 10-1-2~~ **of this article.**

329 IAC 10-15-1 General requirements

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 25-17.6-1-6.5; IC 36-9-30

Sec. 1. (a) A permit application for a new MSWLF or a lateral expansion must be accompanied by the following plans and documentation:

- (1) Plot plans as specified under section 2 of this rule.
- (2) Cross-sectional drawings and details as specified under section 3 of this rule.
- (3) A hydrogeologic site investigation report as specified under sections 4 and 5 of this rule.
- (4) An operational plan of the proposed MSWLF as specified under section 6 of this rule.
- (5) A CQA/CQC plan as specified under section 7 of this rule.
- (6) Calculations and analyses pertaining to MSWLF design as specified under section 8 of this rule.
- (7) An explosive gas management plan as specified under 329 IAC 10-20-17.
- (8) A closure plan as specified under 329 IAC 10-22-2.
- (9) A post-closure plan, as specified under 329 IAC 10-23-3.
- (10) A quality assurance project plan as specified under 329 IAC 10-21-2(b)(13).
- (11) A sampling and analysis plan as specified under 329 IAC 10-21-2.
- (12) A general description for developing **a the** statistical evaluation plan **as that is** required by 329 IAC 10-21-6(c). The description must include a time frame for submitting the statistical evaluation plan.
- (13) If applicable, a baled waste management plan as specified under section 9 of this rule.
- (14) A leak detection plan as specified under section 10 of this rule.
- (15) A leachate collection contingency plan as specified under section 11 of this rule.

specified under section 12 of this rule.

~~(16)~~ (17) Other plans as may be required by the commissioner.

(b) Plans and documentation that accompany a permit application for a new MSWLF or a lateral expansion must be certified as follows:

(1) The hydrogeologic site investigation report required in subsection (a)(3) must be certified by a ~~certified~~ **licensed** professional geologist **under IC 25-17.6-1-6.5.** or a qualified ground water scientist, either of whom shall have educational or professional experience in hydrogeology or ground water hydrology.

(2) With the exception of the hydrogeologic site investigation report and the sampling and analysis plan, all plans and documentation required in subsection (a) must be certified by a registered professional engineer.

(c) A full set of plans and documentation required by this section must accompany each of the five (5) copies of the permit application required in 329 IAC 10-11-2.1(c). ~~In addition to the paper copies, a copy of the plans and documentation required by this section may also be submitted on a computer diskette, the type and format of which will be prescribed by the department.~~

(d) All plans and documentation must be properly titled.

329 IAC 10-15-2 Plot plan requirements

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1

Affected: IC 13-30-2; IC 36-9-30

Sec. 2. (a) Plot plans required by subsections (b) through (d) must:

- (1) use a scale of at least one (1) inch per one hundred (100) feet for a MSWLF of less than eighty (80) acres;
- (2) use a scale of at least one (1) inch per two hundred (200) feet, for a MSWLF of eighty (80) acres to and including one hundred fifty (150) acres;
- (3) use a scale of at least one (1) inch per three hundred (300) feet for an MSWLF greater than one hundred fifty (150) acres;
- (4) include a bar scale on each drawing;
- (5) include elevations that correlate with United States Geological Survey (USGS) mean sea level data;
- (6) include a north arrow; and

(16) A storm water pollution prevention plan as specified under section 12 of this rule.

~~(16)~~ (17) Other plans as may be required by the commissioner **based on particular site or facility conditions.**

(b) Plans and documentation that accompany a permit application for a new MSWLF or a lateral expansion must be certified as follows:

(1) The hydrogeologic site investigation report required in subsection (a)(3) must be certified by a ~~certified~~ **licensed** professional geologist or a qualified ground water scientist, either of whom shall have educational or professional experience in hydrogeology or ground water hydrology.

(2) With the exception of the hydrogeologic site investigation report and the sampling and analysis plan, all plans and documentation required in subsection (a) must be certified by a registered professional engineer.

(c) A full set of plans and documentation required by this section must accompany each of the five (5) copies of the permit application required in 329 IAC 10-11-2.1(c). ~~In addition to the paper copies, a copy of the plans and documentation required by this section may also be submitted on a computer diskette, the type and format of which will be prescribed by the department.~~

(d) All plans and documentation must be properly titled.

329 IAC 10-15-2 Plot plan requirements

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1

Affected: IC 13-30-2; IC 36-9-30

Sec. 2. (a) Plot plans required by subsections (b) through (d) must:

- (1) use a scale of at least one (1) inch per one hundred (100) feet for a MSWLF of less than eighty (80) acres;
- (2) use a scale of at least one (1) inch per two hundred (200) feet, for a MSWLF of eighty (80) acres to and including one hundred fifty (150) acres;
- (3) use a scale of at least one (1) inch per three hundred (300) feet for an MSWLF greater than one hundred fifty (150) acres;
- (4) include a bar scale on each drawing;
- (5) include elevations that correlate with United States Geological Survey (USGS) mean sea level data;
- (6) include a north arrow; and

(7) include a map legend.

(b) A permit application for a new MSWLF or a lateral expansion must be accompanied by an existing features plot plan that includes the facility boundary, and the solid waste boundary and indicates the presence or absence of each of the following features within three hundred (300) feet **outside** of the facility boundary:

- (1) Location and elevations of all existing boreholes.
- (2) Rock outcroppings.
- (3) Surface water run-off directions.
- (4) Fences.
- (5) Utility easements and rights-of-way.
- (6) Existing structures.
- (7) Benchmark descriptions.
- (8) Surface contours with intervals of no more than:
 - (A) two (2) feet if the MSWLF is less than eighty (80) acres; or
 - (B) five (5) feet if the MSWLF is equal to or greater than eighty (80) acres.
- (9) Real property boundary.

(c) The proposed final contour plot plan required by subsection (d)(1) must indicate surface contours of the MSWLF and three hundred (300) feet beyond the facility boundary. The contour intervals must be no more than:

- (1) two (2) feet if the MSWLF is less than eighty (80) acres; or
- (2) five (5) feet if the MSWLF is equal to or greater than eighty (80) acres.

(d) A permit application for a new MSWLF or a lateral expansion must be accompanied by plot plans showing the following:

- (1) Proposed final contours, indicating the following features that would remain after closure:
 - (A) Any buildings.
 - (B) Proposed drainage.
 - (C) Proposed sedimentation and erosion control structures.
 - (D) Proposed vegetation, fencing, and visual screening.
 - (E) Proposed roadways providing access to and around the site that are necessary for post-closure care and monitoring.
 - (F) Proposed berms, flood protection dikes, and surface water diversion structures.
 - (G) Proposed explosive gas monitoring and management system.

(7) include a map legend.

(b) A permit application for a new MSWLF or a lateral expansion must be accompanied by an existing features plot plan that includes the facility boundary, and the solid waste boundary and indicates the presence or absence of each of the following features within **the facility boundary**. **The presence or absence of features listed in subdivisions (1) through (9) must also be indicated to three hundred (300) feet outside** of the facility boundary:

- (1) Location and elevations of all existing boreholes.
- (2) Rock outcroppings.
- (3) Surface water run-off directions.
- (4) Fences.
- (5) Utility easements and rights-of-way.
- (6) Existing structures.
- (7) Benchmark descriptions.
- (8) Surface contours with intervals of no more than:
 - (A) two (2) feet if the MSWLF is less than eighty (80) acres; or
 - (B) five (5) feet if the MSWLF is equal to or greater than eighty (80) acres.
- (9) Real property boundary.

(10) All existing and historical underground or above ground storage tank locations.

(11) All existing and historical outdoor storage areas for fuels, processing equipment, and other containerized materials, such as drums and totes.

(c) The proposed final contour plot plan required by subsection (d)(1) must indicate surface contours of the MSWLF and three hundred (300) feet beyond the facility boundary. The contour intervals must be no more than:

- (1) two (2) feet if the MSWLF is less than eighty (80) acres; or
- (2) five (5) feet if the MSWLF is equal to or greater than eighty (80) acres.

(d) A permit application for a new MSWLF or a lateral expansion must be accompanied by plot plans showing the following:

- (1) Proposed final contours, indicating the following features that would remain after closure:
 - (A) Any buildings.
 - (B) Proposed drainage.
 - (C) Proposed sedimentation and erosion control structures.

- (H) Proposed solid waste boundary.
- (I) Proposed monitoring wells.
- (2) Proposed leachate collection system, indicating the following:
 - (A) Proposed ~~soil liner top~~ **uppermost contour of the soil liner.**
 - (B) Piping layout.
 - (C) Cleanout and riser locations.
 - (D) Sump contours or elevations if applicable.
 - (E) Lift station locations if applicable.
 - (F) Leachate storage areas if applicable.
- ~~applicable.~~
- (3) Initial facility development plan and details, indicating the following:
 - (A) Proposed benchmarks.
 - (B) Proposed buildings and on-site transfer.
 - (C) Proposed drainage, including permanent sedimentation and erosion control structures, **including only typical details for temporary erosion structures.**
 - (D) Proposed explosive gas monitoring and management system.
 - (E) Proposed fencing and visual screening.
 - (F) Proposed on-site roads.
 - (G) Proposed **uppermost contour of the soil liner.** ~~top contours.~~
 - (H) ~~On-site~~ Borrow area for soil liner material and daily cover if applicable.
 - (I) **Delineation of other construction activities within the property boundary of the landfill.**
- (4) Operational plot plan indicating the sequence of cell development, and indicating the following:
 - (A) Additional proposed benchmarks, if applicable.
 - (B) Additional proposed buildings, if applicable.
 - (C) Additional drainage features and permanent erosion and sediment control features, **including only typical details for temporary erosion structures.**
 - (D) Additional fencing and visual screening.
 - (E) Proposed on-site roads.
 - (F) Direction of fill progression.
- (5) Any other plot plan that ~~may be determined to be required by~~ the commissioner **may require based on particular site or facility conditions.**

- (D) Proposed vegetation, fencing, and visual screening.
- (E) Proposed roadways providing access to and around the site that are necessary for post-closure care and monitoring.
- (F) Proposed berms, flood protection dikes, and surface water diversion structures.
- (G) Proposed explosive gas monitoring and management system.
- (H) Proposed solid waste boundary.
- (I) Proposed monitoring wells.
- (2) Proposed leachate collection system, indicating the following:
 - (A) Proposed ~~soil liner top~~ **uppermost contour of the soil liner.**
 - (B) Piping layout.
 - (C) Cleanout and riser locations.
 - (D) Sump contours or elevations if applicable.
 - (E) Lift station locations if applicable.
 - (F) Leachate storage areas if applicable.
- ~~applicable.~~
- (3) Initial facility development plan and details, indicating the following:
 - (A) Proposed benchmarks.
 - (B) Proposed buildings and on-site transfer.
 - (C) Proposed drainage, including permanent sedimentation and erosion control structures, **including typical details for temporary erosion structures.**
 - (D) Proposed explosive gas monitoring and management system.
 - (E) Proposed fencing and visual screening.
 - (F) Proposed on-site roads.
 - (G) Proposed **uppermost contour of the soil liner** ~~top contours.~~
 - (H) ~~On-site~~ Borrow area for soil liner material and daily cover if applicable.
 - (I) **Delineation of other construction activities within the real property boundary of the landfill.**
- (4) Operational plot plan indicating the sequence of cell development, and indicating the following:
 - (A) Additional proposed benchmarks, if applicable.
 - (B) Additional proposed buildings, if applicable.
 - (C) Additional drainage features and permanent erosion and sediment control features, **including typical details for temporary erosion structures.**
 - (D) Additional fencing and visual screening.
 - (E) Proposed on-site roads.

329 IAC 10-15-5 Description of proposed ground water monitoring well system

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 5. (a) The hydrogeologic site investigation report that accompanies permit applications for new MSWLFs and lateral expansions must contain a description of the proposed **ground water** monitoring well system that, at a minimum, includes the following information:

- (1) Monitoring point locations, design, and installation procedures. Installation procedures must comply with 329 IAC 10-21-4.
- (2) A thorough evaluation of the suitability of any existing monitoring points proposed for inclusion in the **ground water** monitoring well system.
- (3) An explanation of how the proposed **ground water** monitoring well system addresses the hydrogeologic conditions identified within the uppermost aquifer system and any significant zones of saturation that exist above the uppermost aquifer system.
- (4) A description of how and where ground water monitoring wells will be installed at appropriate locations and depths, to yield ground water samples from the uppermost aquifer and any significant zones of saturation that exist above the uppermost aquifer system. Ground water samples must represent both the quality of background ground water quality that has not been affected by the proposed MSWLF unit and ground water quality passing the monitoring boundary of the proposed MSWLF unit.
- (5) A description of how ~~upgradient~~ **background ground water monitoring** wells will monitor the

- (F) Direction of fill progression.
- (G) **An outline of impervious surfaces, which includes pavement and buildings.**
- (H) **All permanently designated plowed or snow storage locations.**
- (I) **All loading and unloading areas for solid and liquid bulk materials.**
- (J) **All proposed outdoor storage areas for fuels, processing equipment, and other containerized materials, such as drums and totes.**
- (K) **Outdoor processing areas.**
- (L) **Outdoor waste storage areas.**

(5) Any other plot plan that ~~may be determined to be required by the commissioner~~ **may require based on particular site or facility conditions.**

329 IAC 10-15-5 Description of proposed ground water monitoring well system

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 5. (a) The hydrogeologic site investigation report that accompanies permit applications for new MSWLFs and lateral expansions must contain a description of the proposed **ground water** monitoring well system that, at a minimum, includes the following information:

- (1) Monitoring point locations, design, and installation procedures. Installation procedures must comply with 329 IAC 10-21-4.
- (2) A thorough evaluation of the suitability of any existing monitoring points proposed for inclusion in the **ground water** monitoring well system.
- (3) An explanation of how the proposed **ground water** monitoring well system addresses the hydrogeologic conditions identified within the uppermost aquifer system and any significant zones of saturation that exist above the uppermost aquifer system.
- (4) A description of how and where ground water monitoring wells will be installed at appropriate locations and depths, to yield ground water samples from the uppermost aquifer and any significant zones of saturation that exist above the uppermost aquifer system. Ground water samples must represent both the quality of background ground water ~~quality~~ that has not been affected by the proposed MSWLF unit and **quality of** ground water quality passing the monitoring boundary of the proposed MSWLF unit.
- (5) A description of how ~~upgradient~~ **background ground water monitoring** wells will monitor the

same hydrologic units as the downgradient **ground water** monitoring wells.

(6) If a single monitoring well cannot adequately intercept and monitor the vertical extent of a potential pathway of contaminant migration at a sampling location, a description of how a **ground water monitoring** well cluster will be installed.

(7) For the uppermost aquifer system, a description of how ground water monitoring well spacing will not exceed five hundred (500) feet along the monitoring boundary of the proposed MSWLF unit. In geologically complex environments as determined by the commissioner, closer **monitoring** well spacing may be required. Alternate spacing of ground water monitoring wells must be approved by the commissioner.

Monitoring well spacing must provide at least two

(2) **upgradient background ground water monitoring wells** and four (4) downgradient monitoring wells or well clusters within the uppermost aquifer system and any significant zones of saturation that exist above the uppermost aquifer system. An alternate number of **upgradient background** wells must be approved by the commissioner.

(8) **Alternative ground water monitoring devices or sampling devices may be approved by the commissioner if it is demonstrated that the alternative will provide results that represent ground water quality from beneath the MSWLF in an equivalent manner as provided by ground water monitoring wells. Regardless of location of the alternative monitoring device, the monitoring boundary, for the purposes of 329 IAC 10-21-13, must remain within fifty (50) feet of the solid waste boundary. Any such demonstration must include the following:**

(A) **A complete description of the device and how it complies or differs from 329 IAC 10-21-1 through 329 IAC 10-21-13.**

(B) **A scientifically valid justification for any deviations from 329 IAC 10-21.**

(C) **Any references that indicate the proficiency of the device under similar conditions.**

(D) **Provision for the ground water monitoring device or devices construction plan to be approved prior to their construction.**

(E) **A complete description of the proposed location of the device or devices, or the methods of determining the most**

same hydrologic units as the downgradient **ground water** monitoring wells.

(6) If a single monitoring well cannot adequately intercept and monitor the vertical extent of a potential pathway of contaminant migration at a sampling location, a description of how a **ground water monitoring** well cluster will be installed.

(7) For the uppermost aquifer system, a description of how ground water monitoring well spacing will not exceed five hundred (500) feet along the monitoring boundary of the proposed MSWLF unit. In geologically complex environments as determined by the commissioner, closer **monitoring** well spacing may be required. Alternate spacing of ground water monitoring wells ~~must~~ **may** be approved by the commissioner **based on particular site or facility conditions.**

Monitoring well spacing must provide at least two (2) **upgradient background ground water monitoring wells** and four (4) downgradient monitoring wells or well clusters within the uppermost aquifer system and any significant zones of saturation that exist above the uppermost aquifer system. An alternate number of **upgradient background** wells ~~must~~ **may** be approved by the commissioner **based on particular site or facility conditions.**

(b) The commissioner may consider an individual compliance **ground water** monitoring well system for intrawell statistical comparison methods if the permittee can demonstrate either of the following:

(1) The uppermost aquifer system, and any significant zones of saturation that exist above the uppermost aquifer system are discontinuous.

(2) Significant spatial variability exists within the aquifer.

adequate location, including proof of the facility's control, accessibility, and security of each location.

(b) The commissioner may consider an individual compliance **ground water** monitoring well system for intrawell statistical comparison methods if the permittee can demonstrate either of the following:

- (1) The uppermost aquifer system, and any significant zones of saturation that exist above the uppermost aquifer system are discontinuous.
- (2) Significant spatial variability exists within the aquifer.

329 IAC 10-15-8 Calculations and analyses pertaining to landfill design

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 8. (a) The applicant shall provide calculations and analyses pertaining to the design of the proposed MSWLF unit, if applicable, and if necessary as determined by the commissioner, to indicate that the proposed design complies with the design requirements of 329 IAC 10-17. Any required calculations must be accompanied by a discussion of methods, assumptions, and the references used. Calculations that may be required include the following:

- (1) A transmissivity, **in plane hydraulic conductivity**, calculation or an assessment based on the maximum compressive load placed above the geosynthetic, using a minimum safety factor of ten (10), when a geosynthetic material is used for the drainage layer. In addition, the long term creep impact on the transmissivity of the geosynthetic must be evaluated using a minimum safety factor of five (5).
- (2) A permitivity, **cross-plane hydraulic conductivity**, calculation using a minimum factor of safety of fifty (50), when a geosynthetic material is used for the drainage layer.
- (3) A filter-retention calculation **or assessment**, when a geosynthetic material is used for the drainage layer.
- (4) A tensile stresses calculation to evaluate stresses generated during the construction and operation of the interior of the side slope of the proposed MSWLF unit. A minimum safety factor of five (5) on yield is required.
- (5) ~~A strain-settlement calculation to evaluate the ability of the geosynthetic layer to resist down-drag forces resulting from the subsidence of the contained waste. A minimum ultimate safety factor~~

329 IAC 10-15-8 Calculations and analyses pertaining to landfill design

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 8. (a) The applicant shall provide calculations and analyses pertaining to the design of the proposed MSWLF unit, if applicable, and if necessary as determined by the commissioner, to indicate that the proposed design complies with the design requirements of 329 IAC 10-17. Any required calculations must be accompanied by a discussion of methods, assumptions, and the references used. Calculations that may be required include the following:

- (1) A transmissivity, **in plane hydraulic conductivity**, calculation or an assessment based on the maximum compressive load placed above the geosynthetic, using a minimum safety factor of ten (10), when a geosynthetic material is used for the drainage layer. In addition, the long term creep impact on the transmissivity of the geosynthetic must be evaluated using a minimum safety factor of five (5).
- (2) A permitivity, **cross-plane hydraulic conductivity**, calculation using a minimum factor of safety of fifty (50), when a geosynthetic material is used for the drainage layer.
- (3) A filter-retention calculation **or assessment**, when a geosynthetic material is used for the drainage layer.
- (4) A tensile stresses calculation to evaluate stresses generated during the construction and operation of the interior of the side slope of the proposed MSWLF unit. A minimum safety factor of five (5) on yield is required.
- (5) ~~A strain-settlement calculation to evaluate the ability of the geosynthetic layer to resist down-drag forces resulting from the subsidence of the contained waste. A minimum ultimate safety factor~~

of one and one-half (1.5) on ultimate stress is required.

~~(6)~~ (5) A filter-clogging calculation to evaluate the influence of retained soil particles on the permittivity of a geotextile or geonet. Also, a gradient ratio test or a hydraulic conductivity ratio test, as appropriate, must be performed in accordance with test standards specified in 329 IAC 10-17-17.

~~(7)~~ (6) A localized subsidence calculation, if applicable, to evaluate the strains induced in the geomembrane used for the liner system and for final cover.

~~(8)~~ (7) A stability of final cover calculation to evaluate the likelihood and extent to which final cover components may slide with respect to each other. A minimum safety factor of one and three-tenths (1.3) as outlined in Table 1 of this section is required.

~~(9)~~ (8) A **geomembrane geosynthetic anchor or pull-out anchorage calculation or assessment** to evaluate the anchoring capacity and stresses in a geomembrane. A minimum safety factor of one and two-tenths (1.2) is required. **An anchor must provide sufficient restraint to hold a geosynthetic liner in place, but should not be so rigid or strong that the geosynthetic liner will tear before the anchor yields.**

~~(10)~~ (9) A settlement potential calculation to estimate the total and differential settlement of the foundation soil due to stresses imposed by the liner system, in-place waste, daily cover, intermediate cover, equipment usage, and final cover.

~~(11)~~ (10) A bearing capacity and stability calculation to estimate the load bearing capacity and slope stability of the foundation soil during construction. A minimum safety factor of two (2.0) is required for a static condition.

~~(12)~~ A bottom heave and blow-out calculation to estimate the potential for a bottom heave or blow-out due to unequal hydrostatic or gas pressure.

(11) The uplift pressure or hydrostatic pore water pressure must be evaluated based on site-specific conditions.

~~(13)~~ (12) A waste settlement analysis to assess the potential for the final cover system to stretch due to total and differential settlement of the solid waste. If there is a lack of documented settlement of the solid waste, a value of approximately seven percent (7%) to fifteen percent (15%) of the solid waste height may be used for this calculation.

~~(14)~~ (13) A wind uplift force calculation or an

of one and one-half (1.5) on ultimate stress is required.

~~(6)~~ (5) A filter-clogging calculation to evaluate the influence of retained soil particles on the permittivity of a geotextile or geonet. Also, a gradient ratio test or a hydraulic conductivity ratio test, as appropriate, must be performed in accordance with test standards specified in 329 IAC 10-17-17.

~~(7)~~ (6) A localized subsidence calculation, if applicable, to evaluate the strains induced in the geomembrane used for the liner system and for final cover.

~~(8)~~ (7) A stability of final cover calculation to evaluate the likelihood and extent to which final cover components may slide with respect to each other. A minimum safety factor of one and three-tenths (1.3) as outlined in Table 1 of this section is required.

~~(9)~~ (8) A **geomembrane geosynthetic anchor or pull-out anchorage calculation or assessment** to evaluate the anchoring capacity and stresses in a geomembrane. A minimum safety factor of one and two-tenths (1.2) is required. **An anchor must provide sufficient restraint to hold a geosynthetic liner in place, but should not be so rigid or strong that the geosynthetic liner will tear before the anchor yields.**

~~(10)~~ (9) A settlement potential calculation to estimate the total and differential settlement of the foundation soil due to stresses imposed by the liner system, in-place waste, daily cover, intermediate cover, equipment usage, and final cover.

~~(11)~~ (10) A bearing capacity and stability calculation to estimate the load bearing capacity and slope stability of the foundation soil during construction. A minimum safety factor of two (2.0) is required for a static condition.

~~(12)~~ A bottom heave and blow-out calculation to estimate the potential for a bottom heave or blow-out due to unequal hydrostatic or gas pressure.

(11) The uplift pressure or hydrostatic pore water pressure must be evaluated based on site-specific conditions.

~~(13)~~ (12) A waste settlement analysis to assess the potential for the final cover system to stretch due to total and differential settlement of the solid waste. If there is a lack of documented settlement of the solid waste, a value of approximately seven percent (7%) to fifteen percent (15%) of the solid waste height may be used for this calculation.

assessment to provide an indication that wind uplift will not damage the geomembrane during installation.

~~(15)~~ **(14)** A wheel loading calculation to indicate that the amount of wheel loading of construction equipment will not damage the liner system.

~~(16)~~ **(15)** A puncture of geomembrane calculation to indicate that the amount of down drag force induced by the leachate collection sumps and manhole with vertical standpipe settlement will not cause failure of the underlying liner system. A minimum safety factor of two (2.0) on tensile strength at yield is required.

~~(17)~~ **(16)** An erosion calculation to indicate that the erosion rate will not exceed five (5) tons per acre per year, as is required under 329 IAC 10-22-7(c)(3).

~~(18)~~ **(17)** Pipe calculations to assess the leachate collection piping for deflection, buckling, and crushing.

~~(19)~~ **(18)** If applicable, or if required under 329 IAC 10-16-5(b), an analysis of the effect of seismic activity on the structural components of the landfill.

~~(20)~~ **(19)** A peak flow calculation to identify surface water flow expected from a twenty-five (25) year storm.

~~(21)~~ **(20)** A calculation to identify the total run-off volume expected to result from a twenty-four (24) hour, twenty-five (25) year storm event.

~~(22)~~ **(21)** A chemical resistance evaluation to demonstrate that the leachate collection and removal system components are chemically resistant to the waste and the leachate expected to be generated.

~~(23)~~ **(22)** A clogging evaluation to demonstrate that the system as designed will be resistant to clogging throughout the active life and post-closure period of the MSWLF.

~~(24)~~ **(23)** A slope stability analysis that follows the requirements outlined in Table 1 of this subdivision. Any geosynthetic materials installed on landfill slopes must be designed to withstand the calculated tensile forces acting upon the geosynthetic materials. The design must consider the minimum friction angle of the geosynthetic with regard to any soil-geosynthetic or geosynthetic-geosynthetic interface.

~~(14)~~ **(13)** A wind uplift force calculation **or an assessment** to provide an indication that wind uplift will not damage the geomembrane during installation.

~~(15)~~ **(14)** A wheel loading calculation to indicate that the amount of wheel loading of construction equipment will not damage the liner system.

~~(16)~~ **(15)** A puncture of geomembrane calculation to indicate that the amount of down drag force induced by the leachate collection sumps and manhole with vertical standpipe settlement will not cause failure of the underlying liner system. A minimum safety factor of two (2.0) on tensile strength at yield is required.

~~(17)~~ **(16)** An erosion calculation to indicate that the erosion rate will not exceed five (5) tons per acre per year, as is required under 329 IAC 10-22-7(c)(3).

~~(18)~~ **(17)** Pipe calculations to assess the leachate collection piping for deflection, buckling, and crushing.

~~(19)~~ **(18)** If applicable, or if required under 329 IAC 10-16-5(b), an analysis of the effect of seismic activity on the structural components of the landfill.

~~(20)~~ **(19)** A peak flow calculation to identify surface water flow expected from a twenty-five (25) year storm.

~~(21)~~ **(20)** A calculation to identify the total run-off volume expected to result from a **twenty-five (25) year**, twenty-four (24) hour, ~~twenty-five (25) year~~ **storm precipitation** event.

~~(22)~~ **(21)** A chemical resistance evaluation to demonstrate that the leachate collection and removal system components are chemically resistant to the waste and the leachate expected to be generated.

~~(23)~~ **(22)** A clogging evaluation to demonstrate that the system as designed will be resistant to clogging throughout the active life and post-closure period of the MSWLF.

~~(24)~~ **(23)** A slope stability analysis that follows the requirements outlined in Table 1 of this subdivision. Any geosynthetic materials installed on landfill slopes must be designed to withstand the calculated tensile forces acting upon the geosynthetic materials. The design must consider the minimum friction angle of the geosynthetic with regard to any soil-geosynthetic or geosynthetic-geosynthetic interface.

TABLE 1
Minimum Values of Safety Factors for
Slope Stability Analyses **for Liner and Final Cover**
Systems

Consequences of Slope Failure	Uncertainty of Strength Measurements	
	Small ¹	Large ²
No imminent danger to human life or major environmental impact if slope fails	1.25 (1.2)*	1.5 (1.3)*
Imminent danger to human life or major environmental impact if slope fails	1.5 (1.3)*	2.0 or greater (1.7 or greater)*

¹The uncertainty of the strength measurements is smallest when the soil conditions are uniform and high quality strength test data provide a consistent, complete, and logical picture of the strength characteristics.

²The uncertainty of the strength measurements is greatest when the soil conditions are complex and when the available strength data do not provide a consistent, complete, and logical picture of strength characteristics.

*Numbers without parentheses apply **for to** static conditions and those within parentheses apply to seismic conditions.

~~(25)~~ **(24)** Any additional calculation determined by the commissioner to be necessary to ascertain whether the proposed design complies with the requirements of this article.

329 IAC 10-15-12 Storm water pollution prevention plan

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 12. (a) This section applies to the requirements of implementing a storm water pollution prevention plan at an MSWLF.

(b) The plan must:

- (1) identify potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges from the facility;**
- (2) describe implementation of practices and measures that will be used to reduce pollutants in storm water discharges to the facility; and**
- (3) assure compliance with this article.**

TABLE 1
Minimum Values of Safety Factors for
Slope Stability Analyses **for Liner and Final Cover**
Systems

Consequences of Slope Failure	Uncertainty of Strength Measurements	
	Small ¹	Large ²
No imminent danger to human life or major environmental impact if slope fails	1.25 (1.2)*	1.5 (1.3)*
Imminent danger to human life or major environmental impact if slope fails	1.5 (1.3)*	2.0 or greater (1.7 or greater)*

¹The uncertainty of the strength measurements is smallest when the soil conditions are uniform and high quality strength test data provide a consistent, complete, and logical picture of the strength characteristics.

²The uncertainty of the strength measurements is greatest when the soil conditions are complex and when the available strength data do not provide a consistent, complete, and logical picture of strength characteristics.

*Numbers without parentheses apply **for to** static conditions and those within parentheses apply to seismic conditions.

~~(25)~~ **(24)** Any additional calculation determined by the commissioner to be necessary to ascertain whether the proposed design complies with the requirements of this article.

329 IAC 10-15-12 Storm water pollution prevention plan

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 12. (a) This section applies to the requirements of implementing a storm water pollution prevention plan (SWP3) at an MSWLF.

(b) The SWP3 must:

- (1) identify potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges from the facility;**
- (2) describe implementation of practices and measures that will be used to reduce pollutants in storm water discharges from the facility; and**
- (3) assure compliance with this article.**

(c) The pollution prevention plan must, at a minimum, contain the following information:

- (1) Identification, by title, of staff on the facility's storm water pollution prevention team and their responsibilities.**
- (2) A site description and map of the facility describing or showing a description of the planned construction and landfill operational activities.**

(d) The pollution prevention plan must include a written spill response program to include the following information:

- (1) Location, description, and quantity of all response materials and equipment.**
- (2) Response procedures for facility personnel to respond to a release.**
- (3) Contact information for reporting spills, both for facility staff and external emergency response entities.**
- (4) All corrective actions that will be taken for spills found during inspections, testing, and maintenance, must be documented and included in the SWP3.**

(e) A narrative description of potential pollutant source areas, including descriptions for any existing or historical areas, and any other areas thought to be a potential source of storm water exposure to pollutants. The narrative descriptions for each area must include the following:

- (1) Type and typical quantity of materials present in the area.**
- (2) Methods of storage, including presence of any secondary containment measures.**
- (3) Any remedial actions undertaken in the area, including the following:**
 - (A) The date and type of each action, for example, removal of an underground storage tank.**
 - (B) The quantity and type of contaminated materials, such as soils or water, removed or treated.**
 - (C) The results of any analytical sampling data to confirm an adequate removal of contaminated media.**
 - (D) The name and address of any disposal facility utilized.**
- (4) Any release or spill history dating back a period of three (3) years from the date of the pollution prevention plan, in the area, for materials spilled outside of secondary containment structures in excess of the**

(c) The SWP3 must, at a minimum, contain the following information:

- (1) Identification, by title, of staff on the facility's storm water pollution prevention team and their responsibilities.**
- (2) A site description and map of the facility describing or showing a description of the planned construction and landfill operational activities.**

(d) The SWP3 must include a written spill response program to include the following information:

- (1) Location, description, and quantity of all response materials and equipment.**
- (2) Response procedures for facility personnel to respond to a release.**
- (3) Contact information for reporting spills, both for facility staff and external emergency response entities.**
- (4) All corrective actions that will be taken for spills found during inspections, testing, and maintenance, must be documented and included in the SWP3.**

(e) The SWP3 must include a narrative description of potential pollutant sources, including descriptions for any existing or historical areas, and any other areas thought to be a potential source of storm water exposure to pollutants. The narrative descriptions for the facility must include the following:

- (1) Type and typical quantity of materials that are potential pollutant sources present at the facility.**
- (2) Methods of storage, including presence of any secondary containment measures.**
- (3) Any remedial actions undertaken at the facility to eliminate pollutant sources or exposure of storm water to those sources. If a corrective action plan has been developed, the type of remedial action and plan date shall be referenced.**
- (4) Any release or spill history, at the facility, dating back a period of three (3) years from the date of the pollution prevention plan for materials spilled outside of secondary containment structures and impervious surfaces in excess of the materials' reportable quantity or twenty-five (25) gallons, whichever is less, including the following:**
 - (A) The date and type of material released or spilled.**

materials' reportable quantity or twenty-five (25) gallons, whichever is less, including the following:

- (A) The date and type of material released or spilled.
- (B) The estimated volume released or spilled.
- (C) A description of the remedial actions undertaken, including disposal or treatment.
- (D) The results of any analytical sampling data to confirm an adequate removal of contaminated media.

For permit renewals, the history shall date back for a period of five (5) years from the date of the storm water pollution prevention plan.

(5) The descriptions for each area must include a risk identification analysis of chemicals or materials stored or used within the area. The analysis must include the following:

- (A) Toxicity data of chemicals or materials used within the area, referencing appropriate Material Safety Data Sheet information locations.
- (B) The frequency and typical quantity of listed chemicals or materials to be stored on site.
- (C) Potential ways in which storm water discharges may be exposed to listed chemicals and materials.
- (D) The likelihood of the listed chemicals and materials to come into contact with storm water.

(6) A narrative description of existing and planned management practices and measures to improve the quality of storm water run-off leaving the facility property or entering a water of the state. Descriptions must be created for existing or historical areas and any other areas thought to be a potential source of storm water exposure to pollutants. The description must include the following:

- (A) Any existing or planned structural and nonstructural control practices and measures.
- (B) Any treatment the storm water receives prior to leaving the facility property.
- (C) The ultimate disposal of any solid or fluid wastes collected in structural control measures other than by discharge.

(7) A mapped or narrative description of any such management practice or measure must be added

(B) The estimated volume released or spilled.

(C) A description of the remedial actions undertaken, including disposal or treatment.

Depending on the adequacy or completeness of the remedial actions, the spill history shall be used to determine additional pollutant sources that may be exposed to storm water.

(5) The descriptions for the facility must include a risk identification analysis of chemicals or materials that are potential pollutant sources and stored or used within the facility. The analysis must include the following:

- (A) Toxicity data of chemicals or materials used within the facility, referencing appropriate Material Safety Data Sheet information locations.
- (B) The frequency and typical quantity of listed chemicals or materials being stored on site.
- (C) Potential ways in which storm water discharges may be exposed to listed chemicals and materials.
- (D) The likelihood of the listed chemicals and materials coming into contact with storm water.

(6) A narrative description of existing and planned management practices and measures to improve the quality of storm water run-off, impacted by activities at the facility, that leaves the facility boundary or enters waters of the state. Descriptions must be created for existing or historical areas and any other areas that could generate storm water discharges that have been exposed to facility activity and therefore be a potential source of storm water exposure to pollutants. The description must include the following:

- (A) Any existing or planned structural and nonstructural control practices and measures.
- (B) Any treatment the storm water receives prior to leaving the facility boundary or entering waters of the state.
- (C) The ultimate disposal of any solid or fluid wastes collected in structural control measures other than by discharge.

(7) A mapped or narrative description of any such management practice or measure must be added to the SWP3.

to the SWP3.

(f) The facility shall submit with the SWP3 the following:

- (1) The results of monitoring required in 329 IAC 10-20-11(h).
- (2) The monitoring data must include:
 - (A) completed field data sheets;
 - (B) chain-of-custody forms; and
 - (C) laboratory results.
- (3) As two (2) or more sample monitoring events are completed, the laboratory results must be placed in a comparative table, so that each sampled parameter can be compared to indicate water quality improvements in the run-off from the facility.

(g) For the entire facility, storm water exposure to pollutants must be minimized. To ensure this reduction, a written preventative maintenance program must be written and implemented that includes the following:

- (1) Implementation of good housekeeping practices to ensure the facility will be operated in a clean and orderly manner and that pollutants will not have the potential to be exposed to storm water via vehicular tracking or other means.
- (2) Maintenance of storm water management measures, for example, catch basins or the cleaning of oil or water separators. All maintenance must be documented and contained in the SWP3.
- (3) Inspection and testing of facility equipment and systems to ensure appropriate maintenance of such equipment and systems and to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters must be documented and contained in the pollution prevention plan.

(f) The owner, operator, or permittee shall submit with the SWP3 the following:

- (1) The results of monitoring required in 329 IAC 10-20-11(f) of this article.
 - (A) For new facilities and lateral expansions, the results of monitoring shall be submitted one (1) year after the issuance of the MSWLF permit.
- (2) The monitoring data must include:
 - (A) completed field data sheets;
 - (B) chain-of-custody forms; and
 - (C) laboratory results.

If the monitoring data is not placed into the facility's SWP3, the on-site location for storage of the information must be referenced in the SWP3.

- (3) If the evaluation of monitoring data, as required by 329 IAC 10-20-11(g)(2), indicates that the SWP3 has been ineffective in controlling pollutants in storm water discharges from the facility, the commissioner may require modifications to the SWP3. The source of the pollutant parameter must be investigated, and either eliminated or reduced via a management practice or measure to the extent technologically practicable. Insufficient reductions may be used to identify facilities that would be more appropriately covered under an individual storm water NPDES permit.
- (4) A mapped or narrative description of any management practice or measure pursuant to subdivision (3) must be included in the SWP3.

(g) The SWP3 must include a written preventative maintenance program in order to minimize storm water exposure to pollutants. The program must include the following:

- (1) Implementation of good housekeeping practices to ensure the facility will be operated in a clean and orderly manner and that pollutants will not have the potential to be exposed to storm water via vehicular tracking or other means.
- (2) Maintenance of storm water management measures, for example, catch basins or the cleaning of oil/water separators. All maintenance must be documented and contained in the SWP3.
- (3) Inspection and testing results of facility equipment and systems, including spill response equipment as required by subsection (d), to ensure appropriate maintenance of such equipment and systems and to uncover

329 IAC 10-16-1 Airport siting restrictions

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-18; IC 13-20; IC 36-9-30

Sec. 1. (a) This section applies to:

- (1) permit applications under this article for new MSWLFs and lateral expansions; or
- (2) MSWLFs permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996.

(b) Applicants for new MSWLFs and lateral expansions that are applying for a permit under this article must not locate a proposed MSWLF unit within ten thousand (10,000) feet of any airport runway end used by turbojet aircraft or within five thousand (5,000) feet of any airport runway end used by only piston-type aircraft unless the permit application includes a demonstration that the proposed MSWLF unit is designed and operated so as not to pose a bird hazard to aircraft.

(c) Permittees of MSWLFs permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, located within ten thousand (10,000) feet of any airport runway end used by turbojet aircraft or within five thousand (5,000) feet of any airport runway end used by only piston-type aircraft must complete the following:

- (1) A demonstration that any MSWLF unit within the MSWLF is designed and operated so that the MSWLF unit does not pose a bird hazard to aircraft.
- (2) Provide a copy of the demonstration to the commissioner.
- (3) Provide a copy of the demonstration to the affected airport.

(d) Applicants for new MSWLFs and lateral expansions that are applying for a permit under this article or permittees of MSWLFs permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, must complete the following if any proposed or existing MSWLF unit within the MSWLF is located within a five (5) mile radius of any airport runway end used by turbojet or piston-type aircraft:

- (1) Notification to the affected airport and the Federal Aviation Administration (FAA) of the intent to site a solid waste land disposal facility.

conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface water.

329 IAC 10-16-1 Airport siting restrictions

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-18; IC 13-20; IC 36-9-30

Sec. 1. (a) This section applies to:

- (1) permit applications under this article for new MSWLFs and lateral expansions; or
- (2) MSWLFs permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996.

(b) Applicants for new MSWLFs and lateral expansions that are applying for a permit under this article must not locate a proposed MSWLF unit within ten thousand (10,000) feet of any airport runway end used by turbojet aircraft or within five thousand (5,000) feet of any airport runway end used by only piston-type aircraft unless the permit application includes a demonstration that the proposed MSWLF unit is designed and operated so as not to pose a bird hazard to aircraft.

(c) Permittees of MSWLFs permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, located within ten thousand (10,000) feet of any airport runway end used by turbojet aircraft or within five thousand (5,000) feet of any airport runway end used by only piston-type aircraft must complete the following:

- (1) A demonstration that any MSWLF unit within the MSWLF is designed and operated so that the MSWLF unit does not pose a bird hazard to aircraft.
- (2) Provide a copy of the demonstration to the commissioner.
- (3) Provide a copy of the demonstration to the affected airport.

(d) Applicants for new MSWLFs and lateral expansions that are applying for a permit under this article or permittees of MSWLFs permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, must complete the following if any proposed or existing MSWLF unit within the MSWLF is located within a five (5) mile radius of any airport runway end used by turbojet or piston-type aircraft:

- (1) Notification to the affected airport and the Federal Aviation Administration (FAA) of the intent to site a solid waste land disposal facility.

(2) If a demonstration is required by this section, provide a copy of the demonstration to the affected airport.

(e) For all demonstrations, the commissioner may ask for additional information prior to approval or denial of the demonstration.

(f) A new MSWLF must not be permitted to be constructed within six (6) miles of a public airport as specified under 40 CFR 258.10(e), unless the MSWLF permittee has been granted an exemption under 40 CFR 258.10(e)(1).

329 IAC 10-16-8 Karst terrain siting restrictions

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 8. (a) This section applies to:

(1) permit applications under this article for new MSWLFs and lateral expansions; or
(2) MSWLFs permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996.

(b) Applicants for new MSWLFs and lateral expansions that are applying for a permit under this article, and for new MSWLFs and lateral expansions permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, must not locate any MSWLF unit ~~within the new MSWLFs or lateral expansions~~ in or over karst terrains.

(c) MSWLF units permitted and constructed under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, must not be located in or over karst terrains without provisions to collect and contain all of the leachate generated by the MSWLF units and without a demonstration that the integrity of the MSWLF units will not be damaged by subsidence.

(d) For all demonstrations, the commissioner may ask for additional information prior to approval or denial of the demonstration.

(2) If a demonstration is required by this section, provide a copy of the demonstration to the affected airport.

(e) For all demonstrations, the commissioner may ask for additional information prior to approval or denial of the demonstration.

(f) A new MSWLF must not be permitted within six (6) miles of a public airport as specified under 49 USC Sec. 44718, unless the MSWLF permittee has been granted an exemption under 49 USC Sec. 44718. An MSWLF permittee that has been granted an exemption under 49 USC Sec. 44718 must comply with:

- (1) subsection (b);**
- (2) subsection (d);**
- (3) both (b) and (d), if applicable.**

329 IAC 10-16-8 Karst terrain siting restrictions

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 8. (a) This section applies to **all proposed new, or permitted MSWLFs:**

~~(1) permit applications under this article for new MSWLFs and lateral expansions; or
(2) MSWLFs permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996.~~

~~(b) Applicants for new MSWLFs, and lateral expansions, that are applying for a permit under this article, and for new MSWLFs, and lateral expansions, permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, must not locate any~~ **A new MSWLF unit within the new MSWLFs or lateral expansions must not be located in** or over karst terrains.

(c) MSWLF units permitted and constructed under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, must not be located in or over karst terrains without provisions to collect and contain all of the leachate generated by the MSWLF units and without a demonstration that the integrity of the MSWLF units will not be damaged by subsidence.

(d) For all demonstrations, the commissioner may ask for additional information prior to approval or denial of the demonstration.

329 IAC 10-17-7 Geomembrane component of the liner; construction and quality assurance/quality control requirements

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 7. (a) Before geomembrane field construction, of quality the project engineer shall review documentation control testing as follows:

(1) In a review of the testing of raw materials used to manufacture the geomembrane, the project engineer shall do the following:

- (A) Ensure that the quality control testing meets the specifications of the approved construction plan.
- (B) Review copies of the origin and identification of the raw materials.
- (C) Review copies of quality control certificates issued by the producers of the raw materials. The certificates must be accompanied by results of the following tests unless a particular test requirement is waived by the commissioner:
 - (i) Density test.
 - (ii) Melt flow index test.
 - (iii) Any other test deemed necessary by the commissioner to verify raw material quality.

(2) In a review of the testing documentation of the geomembrane rolls that are fabricated into geomembrane, the project engineer shall do the following:

- (A) Check the manufacturer's certified quality control documentation to verify that the geomembrane was continuously inspected during the manufacturing process for the following:
 - (i) Lack of uniformity.
 - (ii) Damage.
 - (iii) Imperfections.
 - (iv) Holes.
 - (v) Cracks.
 - (vi) Thin spots.
 - (vii) Foreign materials.
- (B) Ensure that any imperfections discovered during inspection were repaired and then reinspected, either at the manufacturing facility or on-site at the MSWLF.
- (C) Review the results of **manufacturer's** quality control tests **conducted on the finished product by the geomembrane manufacturer. for conformance with project specifications.** These tests must include, at a minimum, the following:

329 IAC 10-17-7 Geomembrane component of the liner; construction and quality assurance/quality control requirements

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 7. (a) Before geomembrane field construction, the project engineer shall review documentation of quality control testing as follows:

(1) In a review of the testing of raw materials used to manufacture the geomembrane, the project engineer shall do the following:

- (A) Ensure that the quality control testing meets the specifications of the approved construction plan.
- (B) Review copies of the origin and identification of the raw materials.
- (C) Review copies of quality control certificates issued by the producers of the raw materials. The certificates must be accompanied by results of the following tests unless a particular test requirement is waived by the commissioner **based on particular site or facility conditions:**
 - (i) Density test.
 - (ii) Melt flow index test.
 - (iii) Any other test deemed necessary by the commissioner to verify raw material quality.

(2) In a review of the testing documentation of the geomembrane rolls that are fabricated into geomembrane, the project engineer shall do the following:

- (A) Check the manufacturer's certified quality control documentation to verify that the geomembrane was continuously inspected during the manufacturing process for the following:
 - (i) Lack of uniformity.
 - (ii) Damage.
 - (iii) Imperfections.
 - (iv) Holes.
 - (v) Cracks.
 - (vi) Thin spots.
 - (vii) Foreign materials.
- (B) Ensure that any imperfections discovered during inspection were repaired and then reinspected, either at the manufacturing facility or on-site at the MSWLF.
- (C) Review the results of **manufacturer's** quality control tests **conducted on the finished product by the geomembrane manufacturer. for conformance with**

- (i) ~~Single point Stress rupture crack resistance~~ test.
 - (ii) Tensile strength test.
 - (iii) Tear and puncture resistance test.
 - (iv) ~~Any other test deemed necessary by the commissioner to verify finished product quality.~~ **Oxidative induction time (OIT) at:**
 - (AA) standard OIT; or
 - (BB) high pressure OIT.
 - (v) Ultraviolet resistance at high pressure OIT.
 - (vi) ~~Any other test deemed necessary by the commissioner to verify quality.~~
- (3) The project engineer shall ensure that manufacturer quality control testing of the raw materials and of the finished geomembrane product was conducted:
 - (A) as required in the approved construction plans; or
 - (B) as otherwise required by the commissioner.
- (b) During geomembrane field construction, the project engineer shall ensure the following:
 - (1) The geomembrane is installed on supporting soil that is reasonably free of the following:
 - (A) Stones.
 - (B) Organic material, except that organic material naturally occurring in the soil.
 - (C) Irregularities.
 - (D) Protrusions.
 - (E) Loose soil or soft spots.
 - (F) Standing water.
 - (G) Any abrupt change in grade that could damage the geomembrane.
 - (2) All aspects of geomembrane installation are carried out in accordance with the following:
 - (A) The approved construction plan.
 - (B) The manufacturer's recommendations.
 - (C) The design standards described under section 6 of this rule.
 - (D) Any additional requirements necessary to obtain adequate geomembrane liner construction and installation, as specified in the construction plans or as determined by the commissioner **to assure the quality of the geomembrane liner.**
 - (3) The anchor trench is excavated to the length and width prescribed in the approved construction plans.
 - (4) Field seaming is conducted as follows:

project specifications. These tests must include, at a minimum, the following:

- (i) ~~Single point Stress rupture crack resistance~~ test.
 - (ii) Tensile strength test.
 - (iii) Tear and puncture resistance test.
 - (iv) ~~Any other test deemed necessary by the commissioner to verify finished product quality.~~ **Oxidative induction time (OIT) at:**
 - (AA) standard OIT; or
 - (BB) high pressure OIT.
 - (v) Ultraviolet resistance at high pressure OIT.
 - (vi) ~~Any other test deemed necessary by the commissioner to verify quality.~~
- (3) The project engineer shall ensure that manufacturer quality control testing of the raw materials and of the finished geomembrane product was conducted:
 - (A) as required in the approved construction plans; or
 - (B) as otherwise required by the commissioner **based on particular site or facility conditions.**
- (b) During geomembrane field construction, the project engineer shall ensure the following:
 - (1) The geomembrane is installed on supporting soil that is reasonably free of the following:
 - (A) Stones.
 - (B) Organic material, except that organic material naturally occurring in the soil.
 - (C) Irregularities.
 - (D) Protrusions.
 - (E) Loose soil or soft spots.
 - (F) Standing water.
 - (G) Any abrupt change in grade that could damage the geomembrane.
 - (2) All aspects of geomembrane installation are carried out in accordance with the following:
 - (A) The approved construction plan.
 - (B) The manufacturer's recommendations.
 - (C) The design standards described under section 6 of this rule.
 - (D) Any additional requirements necessary to obtain adequate geomembrane liner construction and installation, as specified in the construction plans or as determined by the commissioner **to assure the quality of the geomembrane liner.**

- (A) To meet the requirements for design of the geomembrane component of the liner, as described under section 6 of this rule.
- (B) In a manner that leaves seams free of the following:
- (i) Dust.
 - (ii) Dirt.
 - (iii) Moisture.
 - (iv) Debris.
 - (v) Foreign material of any kind.
- (C) Using an appropriate method consistent with:
- (i) the approved construction plan; or
 - (ii) a method otherwise approved by the commissioner.
- (D) At a time when the following conditions exist, unless otherwise approved by the commissioner or project engineer, or otherwise recommended by the manufacturer:
- (i) Air temperature is at least thirty-two (32) degrees Fahrenheit but does not exceed one hundred twenty (120) degrees Fahrenheit.
 - (ii) Sheet temperature is at least thirty-two (32) degrees Fahrenheit but does not exceed one hundred fifty-eight (158) degrees Fahrenheit.
 - (iii) Wind gusts are not in excess of twenty (20) miles per hour.
- (5) Quality assurance and quality control testing conducted in the field conforms with requirements of the approved construction plan and includes the following:
- (A) A sample is taken from each lot number of geomembrane material that arrives on site and is tested in the following manner for the purpose of fingerprinting the material:
- (i) Thickness of the sample must be measured at a rate of five (5) measurements per roll of geomembrane, at locations evenly distributed throughout the roll.
 - (ii) The following tests must be conducted at a rate of either once per lot or once per fifty thousand (50,000) square feet of geomembrane:
 - (AA) Tensile characteristics test for strength and elongation at yield and at break.
 - (BB) Carbon black content test.
 - (CC) Carbon black dispersion test, if applicable.
- (3) The anchor trench is excavated to the length and width prescribed in the approved construction plans.
- (4) Field seaming is conducted as follows:
- (A) To meet the requirements for design of the geomembrane component of the liner, as described under section 6 of this rule.
- (B) In a manner that leaves seams free of the following:
- (i) Dust.
 - (ii) Dirt.
 - (iii) Moisture.
 - (iv) Debris.
 - (v) Foreign material of any kind.
- (C) Using an appropriate method consistent with:
- (i) the approved construction plan; or
 - (ii) a method otherwise approved by the commissioner **based on equivalent environmental protection**.
- (D) At a time when the following conditions exist, unless otherwise approved by the commissioner **based on particular site or facility conditions**, or project engineer, or otherwise recommended by the manufacturer:
- (i) Air temperature is at least thirty-two (32) degrees Fahrenheit but does not exceed one hundred twenty (120) degrees Fahrenheit.
 - (ii) Sheet temperature is at least thirty-two (32) degrees Fahrenheit but does not exceed one hundred fifty-eight (158) degrees Fahrenheit.
 - (iii) Wind gusts are not in excess of twenty (20) miles per hour.
- (5) Quality assurance and quality control testing conducted in the field conforms with requirements of the approved construction plan and includes the following:
- (A) A sample is taken from each lot number of geomembrane material that arrives on site and is tested in the following manner for the purpose of fingerprinting the material:
- (i) Thickness of the sample must be measured at a rate of five (5) measurements per roll of geomembrane, at locations evenly distributed throughout the roll.
 - (ii) The following tests must be conducted at a rate of either once per lot or once per fifty thousand (50,000) square feet of geomembrane:

- (DD) Any additional tests that are necessary as determined by the commissioner **to demonstrate the integrity of the geomembrane.**
- (B) Visual inspections of the geomembrane material, followed by appropriate repairs and reinspections, are made for:
 - (i) lack of uniformity;
 - (ii) damage;
 - (iii) imperfections;
 - (iv) tears;
 - (v) punctures;
 - (vi) blisters; and
 - (vii) excessive folding.
- (C) Test seams for shear strength and peel strength are made as follows:
 - (i) At the start of each work period for each seaming crew.
 - (ii) After every four (4) hours of continuous seaming.
 - (iii) Every time seaming equipment is changed.
 - (iv) When significant changes in geomembrane temperature, as determined by the project engineer or by manufacturer recommendation, are observed.
 - (v) As required in the approved construction plan.
 - (vi) As may be required by the commissioner.
- (D) Nondestructive seam testing proceeds as follows:
 - (i) Testing is performed on all seams over their full length using a test method:
 - (AA) in accordance with the approved construction plans;
 - (BB) in accordance with section 17 of this rule; or
 - (CC) otherwise acceptable to the commissioner.
 - (ii) Testing is monitored by the project engineer, and seaming and patching operations are inspected for uniformity and completeness.
 - (iii) Results of testing are recorded by the project engineer in records that include the following information:
 - (AA) The location of the seam test.
 - (BB) The test unit number.

- (AA) Tensile characteristics test for strength and elongation at yield and at break.
- (BB) Carbon black content test.
- (CC) Carbon black dispersion test, if applicable.
- (DD) Any additional tests that are necessary as determined by the commissioner **to demonstrate the integrity of the geomembrane.**
- (B) Visual inspections of the geomembrane material, followed by appropriate repairs and reinspections, are made for:
 - (i) lack of uniformity;
 - (ii) damage;
 - (iii) imperfections;
 - (iv) tears;
 - (v) punctures;
 - (vi) blisters; and
 - (vii) excessive folding.
- (C) Test seams for shear strength and peel strength are made as follows:
 - (i) At the start of each work period for each seaming crew.
 - (ii) After every four (4) hours of continuous seaming.
 - (iii) Every time seaming equipment is changed.
 - (iv) When significant changes in geomembrane temperature, as determined by the project engineer or by manufacturer recommendation, are observed.
 - (v) As required in the approved construction plan.
 - (vi) As may be required by the commissioner.
- (D) Nondestructive seam testing proceeds as follows:
 - (i) Testing is performed on all seams over their full length using a test method:
 - (AA) in accordance with the approved construction plans;
 - (BB) in accordance with section 17 of this rule; or
 - (CC) otherwise acceptable to the commissioner **as an equivalent test method.**
 - (ii) Testing is monitored by the project engineer, and seaming and patching

- (CC) The name of the person conducting the test.
- (DD) The results of all tests.
- (EE) Any other information that may be necessary to judge the adequacy of the seaming and patching procedures.
- (E) Geomembrane seams that cannot be nondestructively tested are overlain with geomembrane material of identical type.
- (F) Destructive seam testing is performed at the site, or at an independent laboratory, according to the approved construction plans, and meets the following requirements:
 - (i) Testing is performed:
 - (AA) on a minimum of one (1) test per five hundred (500) feet of seam length if the seam is welded with a fusion weld;
 - (BB) on a minimum of one (1) test per four hundred (400) feet of seam length if the seam is welded with an extrusion weld;
 - (CC) on a minimum of one (1) test for each seaming machine; and
 - (DD) as otherwise required by the commissioner.
 - (ii) Destructive seam testing includes:
 - (AA) a shear strength test; and
 - (BB) a peel strength test.
 - (iii) If a seam location fails destructive testing:
 - (AA) the seam is reconstructed over a minimum of ten (10) feet in each direction from the site of the failed test;
 - (BB) additional samples are taken for testing; and
 - (CC) reconstruction and retesting is repeated, as necessary, until at least eighty percent (80%) of the samples at the test location pass the destructive seam test.

operations are inspected for uniformity and completeness.

(iii) Results of testing are recorded by the project engineer in records that include the following information:

- (AA) The location of the seam test.
- (BB) The test unit number.
- (CC) The name of the person conducting the test.
- (DD) The results of all tests.
- (EE) Any other information that may be necessary to judge the adequacy of the seaming and patching procedures.

- (E) Geomembrane seams that cannot be nondestructively tested are overlain with geomembrane material of identical type.
- (F) Destructive seam testing is performed at the site, or at an independent laboratory, according to the approved construction plans, and meets the following requirements:

- (i) Testing is performed:
 - (AA) on a minimum of one (1) test per five hundred (500) feet of seam length if the seam is welded with a fusion weld; **and**
 - (BB) on a minimum of one (1) test per four hundred (400) feet of seam length if the seam is welded with an extrusion weld; **and**
 - (CC) on a minimum of one (1) test for each seaming machine; **and or**
 - (DD) as otherwise required by the commissioner **based on a testing frequency that will result in equivalent environmental protection.**

- (ii) Destructive seam testing includes:
 - (AA) a shear strength test; and
 - (BB) a peel strength test.

(iii) If a seam location fails destructive testing:

- (AA) the seam is reconstructed over a minimum of ten (10) feet in each direction from the site of the failed test;
- (BB) additional samples are taken for testing; and
- (CC) reconstruction and retesting is repeated, as

329 IAC 10-17-9 Drainage layer component of the liner; construction and quality assurance/quality control requirements

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-20-2; IC 36-9-30

Sec. 9. (a) If the drainage layer material is to consist of soil or soil like materials, the project engineer shall ensure the following:

- (1) A grain size analysis and hydraulic conductivity test is completed **during the installation** for soil drainage layer materials at frequencies described in Table 1 of this subsection.
- (2) The quality control and quality assurance testing of the soil drainage material meets the requirements of the approved construction plans.
- (3) The soil drainage layer is constructed and graded in accordance with the approved construction plans.
- (4) **Carbonate content testing must be performed prior to and during the installation of a drainage layer, if the drainage material is limestone (CaCO_3) or dolomite/dolostone ($\text{Ca-Mg}(\text{CO}_3)_2$) or from a source likely to contain a high percentage of carbonate materials. The test must be performed:**
 - (A) at a pH of less than seven (7); and
 - (B) at every three thousand (3,000) cubic yards, with a carbonate content no greater than fifteen percent (15%).

Higher carbonate content may be allowed in drainage layer materials if a demonstration is submitted showing that the hydraulic conductivity of the drainage layer will not be decreased below the minimum of 10^{-1} centimeters per second because of carbonate mineral precipitation.

TABLE 1

Soil Drainage Layer Materials:
Minimum Testing Frequencies

Item Tested	Minimum Frequency
Grain size (to the No. 200 sieve)	1 test per 1,500 cubic yards (2,400 per ton)
Hydraulic conductivity test	1 test per 3,000 cubic yards (4,800 per ton) or minimum of 3 tests

(b) If the drainage layer material is to consist of a

necessary, until at least eighty percent (80%) of the samples at the test location pass the destructive seam test.

329 IAC 10-17-9 Drainage layer component of the liner; construction and quality assurance/quality control requirements

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-20-2; IC 36-9-30

Sec. 9. (a) If the drainage layer material is to consist of soil or soil like materials, the project engineer shall ensure the following:

- (1) A grain size analysis and hydraulic conductivity test is completed **during the installation** for soil drainage layer materials at frequencies described in Table 1 of this subsection.
- (2) The quality control and quality assurance testing of the soil drainage material meets the requirements of the approved construction plans.
- (3) The soil drainage layer is constructed and graded in accordance with the approved construction plans.
- (4) **Carbonate content testing must be performed prior to and during the installation of a drainage layer, if the drainage material is limestone (CaCO_3) or dolomite/dolostone ($\text{Ca-Mg}(\text{CO}_3)_2$) or from a source likely to contain a high percentage of carbonate materials. The test must be performed:**
 - (A) at a pH of less than seven (7); and
 - (B) at every three thousand (3,000) cubic yards.

The test results must show a carbonate content no greater than fifteen percent (15%). Higher carbonate content may be allowed in drainage layer materials if a demonstration is submitted showing that the hydraulic conductivity of the drainage layer will not be decreased below the minimum of 10^{-1} centimeters per second because of carbonate mineral precipitation.

TABLE 1

Soil Drainage Layer Materials:
Minimum Testing Frequencies

Item Tested	Minimum Frequency
Grain size (to the No. 200 sieve)	1 test per 1,500 cubic yards (2,400 per ton)
Hydraulic conductivity test	1 test per 3,000 cubic yards (4,800 per ton) or minimum of 3 tests

geosynthetic material, the project engineer shall ensure the following:

- (1) The geosynthetic drainage layer material is chemically compatible with the waste to be deposited and with the leachate that will be generated.
- (2) Effective liquid removal will be maintained by the drainage layer throughout the active life, closure and post-closure period of the MSWLF.
- (3) The geosynthetic drainage layer is constructed and installed in accordance with the approved construction plans.
- (4) The quality control and quality assurance testing of the geosynthetic drainage material meets the requirements of the approved construction plans.
- (5) Results of the following tests, or equivalent tests where applicable to a specific product, and the following criteria are adequately addressed:
 - (A) If the geosynthetic material is a geotextile:
 - (i) grab elongation test;
 - (ii) grab tensile strength test;
 - (iii) puncture resistance test;
 - (iv) trapezoidal tear test;
 - (v) ultraviolet (five hundred (500) hours) resistance test;
 - (vi) abrasion or tumble test;
 - (vii) permittivity test;
 - (viii) apparent opening size (AOS) test;
 - (ix) long term flow (clogging) test;
 - (x) gradient ratio (clogging) test;
 - (xi) the nature of the fibers (i.e., continuous filament or stable fibers);
 - (xii) the chemical compatibility of the geotextile;
 - (xiii) the polymer composition;
 - (xiv) the structure of the geotextile (i.e., woven or nonwoven);
 - (xv) thermal degradation and oxidation in extreme acidic conditions;
 - (xvi) pH resistance of the geotextile;
 - (xvii) creep;
 - (xviii) resistance to extreme temperature;
 - (xix) resistance to bacteria;
 - (xx) resistance to burial deterioration;
 - and
 - (xxi) other tests or information that may become necessary, as determined by the commissioner, **to demonstrate the integrity of the drainage layer component.**

(b) If the drainage layer material is to consist of a geosynthetic material, the project engineer shall ensure the following:

- (1) The geosynthetic drainage layer material is chemically compatible with the waste to be deposited and with the leachate that will be generated.
- (2) Effective liquid removal will be maintained by the drainage layer throughout the active life, closure and post-closure period of the MSWLF.
- (3) The geosynthetic drainage layer is constructed and installed in accordance with the approved construction plans.
- (4) The quality control and quality assurance testing of the geosynthetic drainage material meets the requirements of the approved construction plans.
- (5) Results of the following tests, or equivalent tests where applicable to a specific product, and the following criteria are adequately addressed:
 - (A) If the geosynthetic material is a geotextile:
 - (i) grab elongation test;
 - (ii) grab tensile strength test;
 - (iii) puncture resistance test;
 - (iv) trapezoidal tear test;
 - (v) ultraviolet (five hundred (500) hours) resistance test;
 - (vi) abrasion or tumble test;
 - (vii) permittivity test;
 - (viii) apparent opening size (AOS) test;
 - (ix) long term flow (clogging) test;
 - (x) gradient ratio (clogging) test;
 - (xi) the nature of the fibers (i.e., continuous filament or stable fibers);
 - (xii) the chemical compatibility of the geotextile;
 - (xiii) the polymer composition;
 - (xiv) the structure of the geotextile (i.e., woven or nonwoven);
 - (xv) thermal degradation and oxidation in extreme acidic conditions;
 - (xvi) pH resistance of the geotextile;
 - (xvii) creep;
 - (xviii) resistance to extreme temperature;
 - (xix) resistance to bacteria;
 - (xx) resistance to burial deterioration;
 - and
 - (xxi) other tests or information that may become necessary, as determined by the commissioner, **to demonstrate**

- (B) If the geosynthetic material is a geonet:
- (i) tensile strength test;
 - (ii) hydraulic transmissivity test;
 - (iii) specific gravity test;
 - (iv) melt flow index test;
 - (v) carbon black content test;
 - (vi) abrasion or tumble test;
 - (vii) creep;
 - (viii) thickness;
 - (ix) chemical compatibility;
 - (x) resistance to extreme temperature;
 - (xi) resistance to bacteria;
 - (xii) resistance to burial deterioration;
- and
- (xiii) other tests or information that may become necessary, as determined by the commissioner, **to demonstrate the integrity of the geosynthetic material.**

329 IAC 10-19-1 Preoperational requirements and operational approval

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 1. (a) A new MSWLF or lateral expansion that is permitted under this article must not accept solid waste before the owner, operator, or permittee submits to the commissioner a certification of completion. The certification of completion is a written statement by the owner, operator, or permittee that certifies the following:

(1) A construction certification report (CCR) has been prepared by a professional engineer and has been submitted to the commissioner. In the CCR, the professional engineer shall certify that the construction of the liner system components proceeded in accordance with the approved construction plans. The CCR must also include the following items:

- (A) The following information for all components of the liner system:
- (i) Documentation provided by the manufacturer that describes quality control and quality assurance tests conducted on raw materials and products used in the construction of the liner system component, including a description of methods for sample selection and the frequency with which tests were conducted.

the integrity of the drainage layer component.

- (B) If the geosynthetic material is a geonet:
- (i) tensile strength test;
 - (ii) hydraulic transmissivity test;
 - (iii) specific gravity test;
 - (iv) melt flow index test;
 - (v) carbon black content test;
 - (vi) abrasion or tumble test;
 - (vii) creep;
 - (viii) thickness;
 - (ix) chemical compatibility;
 - (x) resistance to extreme temperature;
 - (xi) resistance to bacteria;
 - (xii) resistance to burial deterioration;
- and
- (xiii) other tests or information that may become necessary, as determined by the commissioner, **to demonstrate the integrity of the geosynthetic material.**

329 IAC 10-19-1 Preoperational requirements and operational approval

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 1. (a) A new MSWLF or lateral expansion that is permitted under this article must not accept solid waste before the owner, operator, or permittee submits to the commissioner a certification of completion. The certification of completion is a written statement by the owner, operator, or permittee that certifies the following:

(1) A construction certification report (CCR) has been prepared by a **registered** professional engineer and has been submitted to the commissioner. In the CCR, the **registered** professional engineer shall certify that the construction of the liner system components proceeded in accordance with the approved construction plans. The CCR must also include the following items:

- (A) The following information for all components of the liner system:
- (i) Documentation provided by the manufacturer that describes quality control and quality assurance tests conducted on raw materials and products used in the construction of the liner system component, including a description of methods for sample selection and the frequency with which tests were conducted.

- (ii) Certification that the CQA/CQC tests were conducted in accordance with the approved construction plan, or as specified by the commissioner.
 - (iii) A summary of the results of all testing, including documentation of any failed test results.
 - (iv) A description of corrective measures taken in response to failed tests.
 - (v) A description of all retesting conducted and the results of those tests.
 - (vi) A description of the previous relevant work experience and qualifications of the field crew foreman in charge of liner installation.
- (B) The following information for the soil component of the liner system:
- (i) All measures taken to prevent or remedy soil liner damage from either desiccation or freezing, both during and after construction.
 - (ii) The results of all testing required in Table 1 and Table 2 of 329 IAC 10-17-5(a), including:
 - (AA) description of steps taken to correct any improperly constructed soil material; and
 - (BB) test frequencies.
 - (iii) Certification that construction quality control testing indicated the soil liner material met the applicable hydraulic conductivity requirements.
- (C) The following information for the geomembrane component of the liner system:
- (i) Certification that the test seams were made:
 - (AA) at the start of work for each seaming crew;
 - (BB) after every four (4) hours of continuous seaming;
 - (CC) every time seam equipment is changed;
 - (DD) when significant changes in geomembrane temperature are observed; and
 - (EE) as additionally required in the approved construction plans.
 - (ii) Certification that field seams were nondestructively tested using a method in accordance with the Geosynthetic Research Institute (GRI); the American Society for Testing and Materials

- (ii) Certification that the CQA/CQC tests were conducted in accordance with the approved construction plan, ~~or as specified by the commissioner.~~
 - (iii) A summary of the results of all testing, including documentation of any failed test results.
 - (iv) A description of corrective measures taken in response to failed tests.
 - (v) A description of all retesting conducted and the results of those tests.
 - (vi) A description of the previous relevant work experience and qualifications of the field crew foreman in charge of liner installation.
- (B) The following information for the soil component of the liner system:
- (i) All measures taken to prevent or remedy soil liner damage from either desiccation or freezing, both during and after construction.
 - (ii) The results of all testing required in Table 1 and Table 2 of 329 IAC 10-17-5(a), including:
 - (AA) description of steps taken to correct any improperly constructed soil material; and
 - (BB) test frequencies.
 - (iii) Certification that construction quality control testing indicated the soil liner material met the applicable hydraulic conductivity requirements.
- (C) The following information for the geomembrane component of the liner system:
- (i) Certification that the test seams were made:
 - (AA) at the start of work for each seaming crew;
 - (BB) after every four (4) hours of continuous seaming;
 - (CC) every time seam equipment is changed;
 - (DD) when significant changes in geomembrane temperature are observed; and
 - (EE) as additionally required in the approved construction plans.
 - (ii) Certification that field seams were nondestructively tested using a method in accordance with the Geosynthetic Research Institute (GRI); the American Society for Testing and Materials

(ASTM); the National Sanitation Foundation (NSF); ~~current industry standards;~~ or with construction plans and specifications.

(iii) Certification that all seams that could not be nondestructively tested were overlain with geomembrane material of the same type.

(iv) Certification that a professional engineer monitored all nondestructive testing, informed the installer of any required repairs, and inspected the seaming and patching operation for uniformity and completeness.

(v) Records of:

- (AA) the locations where samples were taken;
- (BB) the name of the person conducting the tests; and
- (CC) the results of all tests.

(D) If an optional drainage layer filter is used in the liner system design, an assessment of the geotextile filter that includes the following information:

- (i) Polymer property density.
- (ii) Polymer type.
- (iii) Ultraviolet stability.
- (iv) Mechanical properties.
- (v) Tensile strength.
- (vi) Permittivity.
- (vii) Apparent opening size.
- (viii) Puncture strength.

(E) Test results documenting the following:

- (i) The chemical compatibility of the geomembrane and leachate collection pipes with waste and leachate. Relevant compatibility test results may be obtained from the manufacturer. If deemed necessary by the commissioner, additional compatibility testing may be required.
- (ii) Adequate transmissivity upon the maximum compressive load for any geosynthetic material used in a drainage layer.

(2) Certifications by a professional engineer or a **certified licensed** professional geologist, whichever is appropriate, have been submitted to the commissioner to certify the following:

- (A) Initial site development and construction has been completed in accordance with the plot plans specified under 329 IAC 10-15-2 and in accordance with any preoperational

(ASTM); the National Sanitation Foundation (NSF); ~~current industry standards;~~ or with construction plans and specifications.

(iii) Certification that all seams that could not be nondestructively tested were overlain with geomembrane material of the same type.

(iv) Certification that a **registered** professional engineer monitored all nondestructive testing, informed the installer of any required repairs, and inspected the seaming and patching operation for uniformity and completeness.

(v) Records of:

- (AA) the locations where samples were taken;
- (BB) the name of the person conducting the tests; and
- (CC) the results of all tests.

(D) If an optional drainage layer filter is used in the liner system design, an assessment of the geotextile filter that includes the following information:

- (i) Polymer property density.
- (ii) Polymer type.
- (iii) Ultraviolet stability.
- (iv) Mechanical properties.
- (v) Tensile strength.
- (vi) Permittivity.
- (vii) Apparent opening size.
- (viii) Puncture strength.

(E) Test results documenting the following:

- (i) The chemical compatibility of the geomembrane and leachate collection pipes with waste and leachate. Relevant compatibility test results may be obtained from the manufacturer. If deemed necessary by the commissioner, additional compatibility testing may be required.
- (ii) Adequate transmissivity upon the maximum compressive load for any geosynthetic material used in a drainage layer.

(2) Certifications by a **registered** professional engineer or a **certified licensed** professional geologist, whichever is appropriate, have been submitted to the commissioner to certify the following:

- (A) Initial site development and construction, **including all permanent storm water**

conditions imposed as conditions in the facility permit, **including all permanent storm water control measures.**

(B) Identifiable boundary markers have been established that delineate the approved facility boundaries and the solid waste boundary.

(C) Permanent on-site benchmarks have been established with latitude and longitude and Universal Transverse Mercator coordinates, where available, and with vertical (mean sea level elevation) and horizontal control, such that no portion of the constructed solid waste disposal area is further than one thousand (1,000) feet from a benchmark, unless a greater distance is:

- (i) necessary to avoid placement of benchmarks on filled areas; and
- (ii) approved by the commissioner.

(D) The installation of all required ground water monitoring wells and piezometers and any required road leading to a **monitoring** well or piezometer has been completed.

(3) The following items have been submitted to the commissioner:

(A) A plot plan indicating location, mean sea level elevations, and identification of all ground water monitoring wells and piezometers.

(B) A copy of all ground water monitoring well and piezometer logs, including diagrammatical drilling logs and diagrammatical design and construction logs.

(C) From each **ground water monitoring** well in the monitoring system, the results of the first of the four (4) required water level measurements and four (4) independent ground water sampling analyses for the constituents in 329 IAC 10-21-15(a) (Table 1A). **Piezometers must be included to collect static water level measurements if part of the ground water monitoring system.** The remaining water level measurements and sampling analyses must be submitted ~~along with an initial statistical evaluation of the ground water quality data~~, no later than six (6) months after the initial receipt of waste at the MSWLF unit.

(D) A ground water potentiometric surface map or a flow map, as described under 329 IAC 10-21-1(p).

(E) All financial responsibility documents have been executed and delivered to the

control measures, has been completed in accordance with the plot plans specified under 329 IAC 10-15-2 and in accordance with any preoperational conditions imposed as conditions in the facility permit.

(B) Identifiable boundary markers have been established that delineate the approved facility boundaries and the solid waste boundary.

(C) Permanent on-site benchmarks have been established with latitude and longitude and Universal Transverse Mercator coordinates, where available, and with vertical (mean sea level elevation) and horizontal control, such that no portion of the constructed solid waste disposal area is further than one thousand (1,000) feet from a benchmark, unless a greater distance is:

- (i) necessary to avoid placement of benchmarks on filled areas; and
- (ii) approved by the commissioner.

(D) The installation of all required ground water monitoring wells and piezometers and any required road leading to a **monitoring** well or piezometer has been completed.

(3) The following items have been submitted to the commissioner:

(A) A plot plan indicating location, mean sea level elevations, and identification of all ground water monitoring wells and piezometers.

(B) A copy of all ground water monitoring well and piezometer logs, including diagrammatical drilling logs and diagrammatical design and construction logs.

(C) From each **ground water monitoring** well in the monitoring system, the results of the first of the four (4) required water level measurements and four (4) independent ground water sampling analyses for the constituents in 329 IAC 10-21-15(a) (Table 1A). **Piezometers must be included to collect static water level measurements if part of the ground water monitoring system.** The remaining water level measurements and sampling analyses must be submitted ~~along with an initial statistical evaluation of the ground water quality data~~, no later than six (6) months after the initial receipt of waste at the MSWLF unit.

(D) A ground water potentiometric surface map or a flow map, as described under 329 IAC 10-21-1(p).

department in the form and amount specified.

(4) All applicable post construction care procedures were followed.

(b) Upon satisfying all the requirements of subsection (a), a new MSWLF or lateral expansion permitted under this article may begin accepting waste in accordance with this article and with any additional permit conditions, unless the commissioner denies operational approval within twenty-one (21) days of receipt of the certification of completion.

329 IAC 10-20-3 Signs

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 3. (a) For all MSWLFs, a sign of at least sixteen (16) square feet must be erected at each MSWLF entrance. The sign must identify the following:

- (1) The MSWLF's name.
- (2) The operating schedule.
- (3) The type of solid waste land disposal facility.
- (4) The MSWLF permit number.
- (5) The name and phone number of a designated emergency contact person to be contacted in case of an emergency.

(b) For purposes of subsection (a)(5), the designated emergency contact person shall be the following:

- (1) Authorized to respond to a reported emergency or be capable of contacting a person authorized to respond to a reported emergency.
- (2) One (1) of the following:
 - (A) An employee or contractor of the facility operator.
 - (B) An answering service who can contact facility emergency personnel.
 - (C) For a municipally owned facility, a local emergency entity and telephone number may be used.

(c) Traffic signs or other devices, as needed, must be provided to promote an orderly traffic pattern to and from the discharge area.

(d) The operator shall post a notice near the main entrance of a new MSWLF when construction is occurring. The notice must be maintained in a legible condition and contain the following

(E) All financial responsibility documents have been executed and delivered to the department in the form and amount specified.

(4) All applicable post construction care procedures were followed.

(b) Upon satisfying all the requirements of subsection (a), a new MSWLF or lateral expansion permitted under this article may begin accepting waste in accordance with this article and with any additional permit conditions, unless the commissioner denies operational approval within twenty-one (21) days of receipt of the certification of completion.

329 IAC 10-20-3 Signs

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 3. (a) For all MSWLFs, **prior to construction activities**, a sign of at least sixteen (16) square feet must be erected at each MSWLF entrance. The sign must identify the following:

- (1) The MSWLF's name.
- (2) The operating schedule.
- (3) The type of solid waste land disposal facility.
- (4) The MSWLF permit number.
- (5) The name and phone number of a designated emergency contact person to be contacted in case of an emergency.

(6) The location of the construction plan if the site does not have an on-site location to store the plan.

(b) For purposes of subsection (a)(5), the designated emergency contact person shall be the following:

- (1) Authorized to respond to a reported emergency or be capable of contacting a person authorized to respond to a reported emergency.
- (2) One (1) of the following:
 - (A) An employee or contractor of the facility operator.
 - (B) An answering service who can contact facility emergency personnel.
 - (C) For a municipally owned facility, a local emergency entity and telephone number may be used.

(c) Traffic signs or other devices, as needed, must be provided to promote an orderly traffic pattern to and from the discharge area.

information:

- (1) The on-site location of a copy of the completed MSWLF operating permit available for viewing.
- (2) Name, telephone number, and address of a local designated emergency contact person.
- (3) Location of the construction plan if the site does not have an on-site location to store the plan.

329 IAC 10-20-8 Records and reports

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 24-6; IC 36-9-30

Sec. 8. (a) The owner, operator, or permittee of a MSWLF shall record and retain at the MSWLF, in an operating record or in an alternative location approved by the commissioner, all MSWLF records, reports, and plans required by this article, including the following:

- (1) An up-to-date copy of the plans and specifications approved by the commissioner in granting the permit.
- (2) A copy of the current permit approved by the commissioner, including any modifications submitted to the commissioner and the response of the commissioner.
- (3) A plot plan that must be updated quarterly. The owner, operator, or permittee shall maintain a log indicating dates of quarterly updates. The plot plan must describe the following:
 - (A) Areas of excavation.
 - (B) Areas of current filling.
 - (C) Areas under intermediate cover.
 - (D) Filled areas lacking final cover.
 - (E) Finished areas with final cover; contoured and seeded.
- (4) Copies of department operating inspection reports during the preceding twelve (12) months.
- (5) An inspection log as required by section 28(c) of this rule.
- (6) A contour map resulting from the annual survey required under section 24(c) of this rule.
- (7) ~~All special waste disposal notifications, certifications, verification notices, notices of denial, site-specific approvals, Documentation of waste determinations, and quarterly reports required under 329 IAC 10-8-1. used to determine compliance with section 14.1(b)(1) of this rule.~~
- (8) Any location restriction demonstration required under 329 IAC 10-16.
- (9) Inspection records, training procedures, and notification procedures required by section 23 of this rule.

329 IAC 10-20-8 Records and reports

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 24-6; IC 36-9-30

Sec. 8. (a) The owner, operator, or permittee of a MSWLF shall record and retain at the MSWLF, in an operating record or in an alternative location approved by the commissioner, all MSWLF records, reports, and plans required by this article, including the following:

- (1) An up-to-date copy of the plans and specifications approved by the commissioner in granting the permit.
- (2) A copy of the current permit approved by the commissioner, including any modifications submitted to the commissioner and the response of the commissioner.
- (3) A plot plan that must be updated quarterly. The owner, operator, or permittee shall maintain a log indicating dates of quarterly updates. The plot plan must describe the following:
 - (A) Areas of excavation.
 - (B) Areas of current filling.
 - (C) Areas under intermediate cover.
 - (D) Filled areas lacking final cover.
 - (E) Finished areas with final cover; contoured and seeded.
- (4) Copies of department operating inspection reports during the preceding twelve (12) months.
- (5) An inspection log as required by section 28(c) of this rule.
- (6) A contour map resulting from the annual survey required under section 24(c) of this rule.
- (7) ~~All special waste disposal notifications, certifications, verification notices, notices of denial, site-specific approvals, Documentation of waste determinations, and quarterly reports required under 329 IAC 10-8-1. used to determine compliance with section 14.1(b)(1) of this rule during the preceding twelve (12) months.~~
- (8) Any location restriction demonstration required under 329 IAC 10-16.

(10) Gas monitoring results from monitoring and any remediation plans required by section 17 of this rule.

(11) Any gas condensate testing results and amounts generated recorded on a weekly basis.

(12) Any leachate testing results and weekly leachate pumping quantities.

(13) Any MSWLF design documentation for placement of leachate or gas condensate in a MSWLF as required under section 27(a)(2) of this rule.

(14) Any demonstration, certification, finding, monitoring, testing, or analytical data required by 329 IAC 10-21. The owner, operator, or permittee shall maintain records of all monitoring information and monitoring activities, including the following:

(A) The date, exact place, and time of the sampling or measurements.

(B) The person or persons who performed the sampling or measurements.

(C) The date or dates analyses were performed.

(D) The person or persons who performed the analyses.

(E) The analytical techniques or methods used.

(F) The results of such measurements or analyses.

(15) Closure and post-closure care plans and any monitoring, testing, or analytical data as required by 329 IAC 10-22 and 329 IAC 10-23.

(16) Any cost estimates and financial assurance documentation required by 329 IAC 10-39.

(17) Under 329 IAC 11-15-4(b), the owner, operator, or permittee of the MSWLF to which the municipal waste is transported shall retain each manifest for one (1) year and send one (1) copy of each manifest to the commissioner within three (3) months after receiving the manifest. The manifests must be retained on-site at the MSWLF and must be made available to the commissioner's staff upon request.

(18) Monitoring records for storm water compliance.

(b) All information contained in the operating record and self-inspections must be furnished upon request to any representative of the commissioner.

(c) All reports submitted to the commissioner must be unbound or bound in a three-hole notebook and preferably copied on both sides of the pages.

(9) Inspection records, training procedures, and notification procedures required by section 23 of this rule.

(10) Gas monitoring results from monitoring and any remediation plans required by section 17 of this rule.

(11) Any gas condensate testing results and amounts generated recorded on a weekly basis.

(12) Any leachate testing results and weekly leachate pumping quantities.

(13) Any MSWLF design documentation for placement of leachate or gas condensate in a MSWLF as required under section 27(a)(2) of this rule.

(14) Any demonstration, certification, finding, monitoring, testing, or analytical data required by **329 IAC 10-1-4(a) and (c), and or** 329 IAC 10-21. ~~The owner, operator, or permittee shall maintain records of all monitoring information and monitoring activities, including the following:~~

~~(A) The date, exact place, and time of the sampling or measurements.~~

~~(B) The person or persons who performed the sampling or measurements.~~

~~(C) The date or dates analyses were performed.~~

~~(D) The person or persons who performed the analyses.~~

~~(E) The analytical techniques or methods used.~~

~~(F) The results of such measurements or analyses.~~

(15) Closure and post-closure care plans and any monitoring, testing, or analytical data as required by 329 IAC 10-22 and 329 IAC 10-23.

(16) Any cost estimates and financial assurance documentation required by 329 IAC 10-39.

(17) Under 329 IAC 11-15-4(b), the owner, operator, or permittee of the MSWLF to which the municipal waste is transported shall retain each manifest for one (1) year and send one (1) copy of each manifest to the commissioner within three (3) months after receiving the manifest. The manifests must be retained on-site at the MSWLF and must be made available to the commissioner's staff upon request.

(18) The storm water pollution prevention plan and monitoring records for storm water compliance.

(b) All information contained in the operating record and self-inspections must be furnished upon request to any representative of the commissioner.

(d) The commissioner may set alternative schedules for record keeping and notification requirements except for 329 IAC 10-16-1(d) and 329 IAC 10-21-13.

329 IAC 10-20-11 Diversion of surface water and run-on and run-off control systems

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 11. (a) The owner, operator, or permittee of MSWLFs shall design, construct, and maintain the following:

- (1) A run-on control system to prevent flow onto the active portion of the MSWLF during the peak discharge from a twenty-five (25) year storm.
- (2) A run-off control system from the active portion of the MSWLF to collect and control at least the water volume resulting from a twenty-four (24) hour, twenty-five (25) year storm.

(b) The owner, operator, or permittee of MSWLFs shall not deposit solid waste in standing or ponded water.

(c) **Storm water** run-off from the active portion of the MSWLF leaving a facility must be handled discharged in accordance with 327 IAC 15-5, 327 IAC 15-6, and the discharge must meet the effluent limitations of the National Pollutant Discharge Elimination System under 327 IAC 5: a manner that does not cause or contribute to erosion or sedimentation or a violation of rules of the water pollution control board at 327 IAC 2-1-6(a).

(d) Appropriate measures shall be planned and installed as part of an erosion and sediment control system.

(e) All storm water quality measures and erosion and sediment controls necessary to comply with this rule must be implemented in accordance with the approved storm water pollution prevention plan.

(f) Monitoring requirements shall be as follows:

- (1) Each discharge outfall, or representative discharge outfall, composed of storm water run-off and any other permitted discharge, shall be monitored as follows:

(c) All reports submitted to the commissioner must be unbound or bound in a three-hole notebook and preferably copied on both sides of the pages.

(d) The commissioner may set alternative schedules for record keeping and notification requirements except for 329 IAC 10-16-1(d) and 329 IAC 10-21-13.

329 IAC 10-20-11 Diversion of surface water, and run-on and run-off control systems, and monitoring

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 11. (a) The owner, operator, or permittee of MSWLFs shall design, construct, and maintain the following:

- (1) A run-on control system to prevent flow onto the active portion of the MSWLF during the peak discharge from a twenty-five (25) year storm.
- (2) A run-off control system from the active portion of the MSWLF to collect and control at least the water volume resulting from a **twenty-five (25) year**, twenty-four (24) hour **precipitation event** ~~twenty-five (25) year storm~~.

(b) The owner, operator, or permittee of MSWLFs shall not deposit solid waste in standing or ponded water.

(c) **Storm water** run-off from the active portion of the leaving an MSWLF must be handled discharged in accordance with 327 IAC 15-5, 327 IAC 15-6, and the discharge must meet the effluent limitations of the National Pollutant Discharge Elimination System under 327 IAC 5: a manner that does not cause or contribute to erosion or sedimentation or a violation of rules of the water pollution control board at 327 IAC 2-1-6(a).

(d) Appropriate measures shall be planned and installed as part of an erosion and sediment control system.

(e) All storm water quality measures and erosion and sediment control measures must be implemented in accordance with the approved storm water pollution prevention plan and the requirements of this article.

(f) Monitoring requirements shall be as follows:

- (1) Each storm water sedimentation basin or series of basins, composed of storm water run-

Parameter	Units	Sample Type	Frequency
Oil and grease	mg/l	grab	Annual
CBOD ₅ (Carbonaceous biochemical oxygen demand)	mg/l	grab	Annual
COD (Chemical oxygen demand)	mg/l	grab	Annual
TSS (Total suspended solids)	mg/l	grab	Annual
TKN (Total Kjeldahl nitrogen)	mg/l	grab	Annual
Total phosphorous	mg/l	grab	Annual
pH	s.u.	grab	Annual
Nitrate plus nitrite nitrogen	mg/l	grab	Annual

(2) Each discharge outfall subject to subdivision (1) shall be monitored for any other pollutant that is reasonably expected to be present in the discharge, as well as for any other pollutant as requested by the commissioner.

(3) Facilities that have other pollutants limited by or required to be monitored under a NPDES discharge permit issued by the commissioner for any discharge shall also monitor the storm water grab sample for any additional parameters listed in that permit. This additional parameter requirement does not include whole effluent toxicity testing, or other parameters required by another NPDES permit which are determined to be in concentrations below laboratory detection limitations.

(4) During the first year after the latest effective date of this section and prior to implementation of the SWP3, an owner, operator or permittee shall sample and analyze the discharge from the outfall identified in the approved pollution prevention plan. The monitoring data taken from this first year event shall be used by the owner, operator, or permittee as an aid in developing and implementing the SWP3. Subsequent annual sampling data shall be used to verify the effectiveness of the SWP3 and will aid the permittee with revising the SWP3 and with the implementation of additional best management practices, as necessary.

(5) The commissioner may require an owner, operator, or permittee to sample additional

off and any other permitted discharge, shall be monitored as follows:

Parameter	Units	Sample Type	Frequency
Total Iron	mg/l	grab	Semi-Annual
Amonia (as N)	mg/l	grab	Semi-Annual
BODs (biochemical oxygen demand)	mg/l	grab	Semi-Annual
TSS (Total suspended solids)	mg/l	grab	Semi-Annual
pH (measured in field)	s.u.	grab	Semi-Annual
Total Phenolics	mg/l	grab	Semi-Annual

(2) Each storm water sedimentation basin or series of basins subject to subdivision (1) shall be monitored for any other pollutant which is reasonably expected to be present in the storm water sedimentation basin or series of basins, as well as for any other pollutant as requested by the commissioner.

(3) During the first twelve (12) months after January 1, 2004, an owner, operator, or permittee shall sample and analyze the storm water sedimentation basin or series of basins identified in the pollution prevention plan. The monitoring data taken from this first year event shall be used by the owner, operator, or permittee as an aid in developing and implementing the SWP3. Subsequent semi-annual sampling data shall be used to verify the effectiveness of the SWP3 and will aid the owner, operator, or permittee with revising the SWP3 and with the implementation of additional best management practices, as necessary.

(A) For new facilities and lateral expansions, the results of monitoring shall be submitted one (1) year after the issuance of the MSWLF permit.

(4) The pH measurement must be taken at the time the grab sample is collected and by using a portable pH meter that has been properly calibrated to the manufacturer's specifications and that provides results displayed in numeric units. A color comparison analysis for pH is not acceptable.

(5) Samples must be collected according to a semi-annual schedule. There shall be a minimum

storm events beyond the required five (5) annual events upon finding reasonable cause. The commissioner shall notify the facility in writing that additional sampling is required.

(6) A grab sample must be collected during the first thirty (30) minutes, or as soon thereafter as practicable.

(7) The pH measurement must be taken at the time the grab sample is collected and by using a portable pH meter that has been properly calibrated to the manufacturer's specifications and that provides results displayed in numeric units. A color comparison analysis for pH is not acceptable.

(8) There shall be a minimum of three (3) months between reported sampling events.

(9) Samples must be taken at a point representative of the discharge but prior to entry into surface waters of the state or a municipal separate storm sewer conveyance, unless an alternative location has been granted by the commissioner. For discharges that flow through on-site detention basins, samples shall be taken at a point representative of the discharge from the basin.

(10) All samples must be collected from a discharge resulting from a measurable storm event at least seventy-two (72) hours from the previous measurable storm event and, where feasible, where the duration and total precipitation does not exceed fifty percent (50%) from the average or median precipitation event in the area, as determined by the nearest United States National Weather Service Information Center. Documentation of weather conditions that prevent sampling as described in this subsection must be provided to the commissioner.

(11) The analytical and sampling methods used must meet quality assurance and quality control requirements.

(12) Run-off events resulting from snow or ice melt should not be sampled and shall not be used to meet the minimum annual monitoring requirements.

(g) Reporting requirements shall be as follows:

(1) All samples must be reported as a value of concentration.

(2) For each measurement or sample taken under this rule, the owner, operator, or permittee of the facility shall record and submit the following information to the

of three (3) months between reported sampling events.

(6) Samples must be taken at a point representative of the outflow from the storm water sedimentation basin or series of basins, but prior to entry into surface waters of the state or a municipal separate storm sewer conveyance.

(g) Reporting requirements shall be as follows:

(1) For each measurement or sample taken under this rule, the owner, operator, or permittee of the facility shall record and submit the following information to the commissioner:

(A) The exact place, date, and time of sampling.

(B) The detection limit for each chemical constituent.

(C) The individual who performed the sampling or measurements.

(D) The dates the analyses were performed.

(E) The individual who performed the analyses.

(F) The analytical techniques or methods used.

(G) The results of all required analyses and measurements.

(H) A complete copy of the laboratory report, including chain-of-custody.

(2) The commissioner will evaluate the storm water monitoring results and compare the results with landfill-specific benchmark monitoring cut-off concentrations and numeric limitations as described in NPDES Storm Water Multi-Sector General Permit for Industrial Activities, Federal Register, Vol. 65, No. 210, October 30, 2000. If the storm water monitoring results indicate that the SWP3 has been ineffective in controlling pollutants in storm water discharges from the facility, then the commissioner may require modifications to the SWP3.

(3) All records and information resulting from the monitoring activities, including all records of analyses performed and calibration and maintenance of instrumentation, must be retained for a minimum of three (3) years.

(4) An owner, operator, or permittee shall submit sampling data results to the commissioner within sixty (60) days of obtaining the storm water samples in a sampling event.

(5) An owner, operator, or permittee of an MSWLF that has a discharge which enters a municipal separate storm sewer shall also submit

commissioner:

- (A) The:**
 - (i) exact place, date, and time of the start of the discharge;**
 - (ii) magnitude of the storm event sampled in inches; and**
 - (iii) time of sampling.**
 - (B) The duration between the storm event sampled and the end of the previous measurable storm event.**
 - (C) The individual who performed the sampling or measurements.**
 - (D) The dates the analyses were performed.**
 - (E) The individual who performed the analyses.**
 - (F) The analytical techniques or methods used.**
 - (G) The results of all required analyses and measurements.**
 - (H) A complete copy of the laboratory report, including chain-of-custody.**
- (3) All records and information resulting from the monitoring activities, including all records of analyses performed and calibration and maintenance of instrumentation, must be retained for a minimum of five (5) years following the expiration of the facility's permit, or longer if requested by the commissioner.**
- (4) An owner, operator, or permittee shall submit sampling data results to the commissioner within thirty (30) days after laboratory analyses have been completed.**
- (5) An owner, operator, or permittee of a facility that has a discharge that enters a municipal separate storm sewer shall also submit a copy of the sampling data results to the operator of the municipal system upon request.**
- (6) If an owner, operator, or permittee monitors a pollutant more frequently than required by this rule, using analytical methods referenced in this rule, the results of such monitoring must be reported as additional information. Such increased frequency must also be indicated.**

a copy of the sampling data results to the operator of the municipal system upon request.

(6) If an owner, operator, or permittee monitors a pollutant more frequently than required by this rule, using analytical methods referenced in this rule, the results of such monitoring must be reported as additional information. Such increased frequency must also be indicated.

329 IAC 10-20-12 Erosion and sedimentation control measures; general requirements

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 12. (a) Erosion and sedimentation control measures must be instituted to minimize the off site migration of any sediment. All run-off from disturbed acreage must pass through a sedimentation basin or an approved alternative sediment control practice. The commissioner may require additional erosion and sediment control measures.

(b) A storm water or sedimentation basin or series of basins permitted and constructed under this article must be constructed in accordance with the following:

- (1) Be designed to handle, simultaneously, the run-off resulting from the ten (10) year, twenty-four (24) hour precipitation event and the sediment storage volume required by subdivision (3).
- (2) An appropriate combination of principal and emergency spillway shall be provided to discharge safely the run-off from a twenty-five (25) year, twenty-four (24) hour precipitation event with a minimum of two (2) feet of freeboard.
- (3) Provide a minimum of three (3) years of sediment storage volume. The following requirements apply:
 - (A) Sediment must be removed from sedimentation basins when the volume of sediment accumulates to fifty percent (50%) or more of the designed sediment storage volume.
 - (B) A sediment storage volume of less than three (3) years may be approved by the commissioner if an annual approved maintenance program will be performed.
- (4) Provide a detention time of at least twenty-four (24) hours for the ten (10) year, twenty-four (24) hour precipitation event. A detention time of less than twenty-four (24) hours may be approved by the commissioner if the following is demonstrated by the owner, operator or permittee:
 - (A) The discharge will not result in the release of a significant quantity of sediment from the MSWLF.
 - (B) Will not violate any local, state, or federal laws pertaining to discharges.
- (5) The principal spillway must be located at a height above the maximum elevation of the designed sediment storage volume required by subdivision (3).

329 IAC 10-20-12 Erosion and sedimentation control measures; general requirements

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 12. (a) Erosion and sedimentation control measures must be instituted to minimize the off site migration of any sediment. All run-off from disturbed acreage must pass through a sedimentation basin or an approved alternative sediment control practice. The commissioner may require additional erosion and sediment control measures **based on site-specific conditions**.

(b) A storm water or sedimentation basin or series of basins permitted and constructed under this article must be constructed in accordance with the following:

- (1) Be designed to handle, simultaneously, the run-off resulting from the ten (10) year, twenty-four (24) hour precipitation event and the sediment storage volume required by subdivision (3).
- (2) An appropriate combination of principal and emergency spillways shall be provided to discharge safely the run-off from a twenty-five (25) year, twenty-four (24) hour precipitation event with a minimum of two (2) feet of freeboard.
- (3) Provide a minimum of three (3) years of sediment storage volume. The following requirements apply:
 - (A) Sediment must be removed from sedimentation basins when the volume of sediment accumulates to fifty percent (50%) or more of the designed sediment storage volume.
 - (B) A sediment storage volume of less than three (3) years may be approved by the commissioner if an annual approved maintenance program will be performed.
- (4) Provide a detention time of at least twenty-four (24) hours for the ten (10) year, twenty-four (24) hour precipitation event. A detention time of less than twenty-four (24) hours may be approved by the commissioner if the following is demonstrated by the owner, operator, or permittee:
 - (A) The discharge will not result in the release of a significant quantity of sediment from the MSWLF.
 - (B) Will not violate any local, state, or federal laws pertaining to discharges.
- (5) The principal spillway must be located at a height above the maximum elevation of the designed sediment storage volume required by subdivision (3).
- (6) Discharge in compliance with all applicable state and federal laws.

(6) Discharge in compliance with all applicable state and federal laws.

(7) The length-to-width ratio of the flow path shall be 2:1 or greater from the inflow to the outflow. Baffles may be used within the basin to achieve this ratio.

(c) If deemed necessary by the commissioner, additional erosion and sediment control practices may be required in the drainage areas of permanent basins for the purposes of increasing the life of the basin and increasing the overall efficiency of removing sediment from run-off.

(d) Alternatives to the requirements in subsections (b) through (c) may be approved by the commissioner. Factors that will be considered include the following:

- (1) The amount of water collected from disturbed areas and undisturbed areas.
- (2) Use of erosion control measures on disturbed areas.
- (3) Sedimentation control measures utilized in the drainageways.

(e) The commissioner may require the submittal of the following information for any storm water/sedimentation pond or basin to verify it is designed and constructed properly:

- (1) Basin plan view.
- (2) Typical cross section.
- (3) All the inlet and outlet elevations.
- (4) Assumptions used to size the basin.
- (5) Calculations used.
- (6) Justifications.

(f) A storm water pollution prevention plan must be prepared in accordance with 329 IAC 10-15-12. The plan must be updated whenever there is a change at the facility that would significantly affect the storm water discharges authorized under the facility permit. The plan must be kept on-site and must be available to the commissioner at the time of an on-site inspection.

(7) The length-to-width ratio of the flow path shall be 2:1 or greater from the inflow to the outflow. Baffles may be used within the basin to achieve this ratio.

(c) If deemed necessary by the commissioner, additional erosion and sediment control practices may be required in the drainage areas of permanent basins for the purposes of increasing the life of the basin and increasing the overall efficiency of removing sediment from run-off.

(d) Alternatives to the requirements in subsections (b) through (c) may be approved by the commissioner. Factors that will be considered include the following:

- (1) The amount of water collected from disturbed areas and undisturbed areas.
- (2) Use of erosion control measures on disturbed areas.
- (3) Sedimentation control measures utilized in the drainageways.

(e) The commissioner may require the submittal of the following information for any storm water/sedimentation pond or basin to verify it is designed and constructed properly:

- (1) Basin plan view.
- (2) Typical cross section.
- (3) All the inlet and outlet elevations.
- (4) Assumptions used to size the basin.
- (5) Calculations used.
- (6) Justifications.

(f) A storm water pollution prevention plan must be prepared in accordance with 329 IAC 10-15-12. The plan must be updated whenever there is a change at the MSWLF that would significantly affect the storm water discharges authorized under the MSWLF's permit. The plan must be kept on-site and must be available to the commissioner at the time of an on-site inspection.

(g) A written non-storm water assessment including the following shall be kept in the facility record:

- (1) A certification statement that storm water discharges entering waters of the state have been evaluated for presence of contaminants and non-storm water contributions. The certification shall include a description of the method used, the date of any testing, and the on-site drainage points that were directly observed during the test.

329 IAC 10-20-24 Survey requirements

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 24. (a) The owner, operator, or permittee of an MSWLF shall maintain the series of identifiable boundary markers required under 329 IAC 10-19-1(a)(2)(B) to delineate the approved solid waste land disposal facility ~~boundaries~~ **boundary** and approved solid waste boundaries for the life of the MSWLF.

(b) The owner, operator, or permittee shall maintain the on-site benchmarks required under 329 IAC 10-19-1(a)(2)(C) so that no portion of the proposed solid waste disposal area is further than one thousand (1,000) feet from a benchmark unless a greater distance is necessary to avoid the placement of benchmarks on filled areas and is approved by the commissioner.

(c) The owner, operator, or permittee shall conduct an annual survey between October 1 and December 31 of each year for the purpose of establishing a contour map that indicates existing contours of the MSWLF and the existing limits of solid waste disposed at the MSWLF. The contour map must be done at the same scale as the final contour map required under 329 IAC 10-15-2. The contour map must indicate the day the survey was conducted and must be submitted to the department by February 15 of the year following the survey in a paper copy form as required by ~~329 IAC 10-15-2(b). In addition to the paper copy, a copy may also be submitted electronically.~~ **section 8 of this rule.**

(d) The owner, operator, or permittee of a currently permitted MSWLF shall submit a present contour map and a proposed final contour map on paper copy form as required by 329 IAC 10-15-2(b). In addition to the paper copy forms, a copy may also be submitted electronically. No subsequent annual

(2) A statement that the facility does not allow detergent or solvent-based washing of equipment or vehicles that would allow washwater additives to enter any storm drainage system or receiving water.

(3) A statement that all interior maintenance areas floor drains that have the potential for maintenance fluids or other materials to enter storm sewers are connected to a sanitary sewer or other appropriate collection system, and that all maintenance fluids or other materials are properly disposed in accordance with all applicable local, state, and federal laws.

329 IAC 10-20-24 Survey requirements

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 24. (a) The owner, operator, or permittee of an MSWLF shall maintain the series of identifiable boundary markers required under 329 IAC 10-19-1(a)(2)(B) to delineate the approved solid waste land disposal facility ~~boundaries~~ **boundary** and approved solid waste boundaries for the life of the MSWLF.

(b) The owner, operator, or permittee shall maintain the on-site benchmarks required under 329 IAC 10-19-1(a)(2)(C) so that no portion of the proposed solid waste disposal area is further than one thousand (1,000) feet from a benchmark unless a greater distance is necessary to avoid the placement of benchmarks on filled areas and is approved by the commissioner.

(c) The owner, operator, or permittee shall conduct an annual survey between October 1 and December 31 of each year for the purpose of establishing a contour map that indicates existing contours of the MSWLF and the existing limits of solid waste disposed at the MSWLF. The contour map must be done at the same scale as the final contour map required under 329 IAC 10-15-2. The contour map must indicate the day the survey was conducted and must be submitted to the department by February 15 of the year following the survey in a paper copy form ~~as required by 329 IAC 10-15-2(b). In addition to the paper copy, a copy may also be submitted electronically.~~

(d) The owner, operator, or permittee of a currently permitted MSWLF shall submit a present contour map and a proposed final contour map on paper copy form as required by 329 IAC 10-15-2(b). In addition to the paper copy forms, a copy may also be submitted electronically. No subsequent annual submissions of

submissions of the final contour map will be necessary unless there is a change to the approved final contours.

329 IAC 10-20-26 Surface water requirements

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-3-1

Affected: IC 13-30-2; IC 36-9-30

Sec. 26. (a) The owner, operator, or permittee of an MSWLF shall not cause a discharge of pollutants into waters of the state, including wetlands, that violates any requirements of **rules of the water pollution control board at 327 IAC** and the Clean Water Act, including the National Pollutant Discharge Elimination System requirements, under Section 402 of the Clean Water Act, 33 U.S.C. 1342, as amended October 31, 1992.

(b) The owner, operator, or permittee of an MSWLF shall not cause the discharge of a nonpoint source of pollution to waters of the United States, including wetlands, that violates any requirement of an area wide or statewide water quality management plan that has been approved under Section 208, 33 U.S.C. 1288, as amended February 4, 1987, or Section 319, 33 U.S.C. 1329, as added February 4, 1987, of the Clean Water Act.

(c) **Proper storage and handling of materials, such as fuels or hazardous wastes, and spill prevention and clean-up measures shall be implemented to minimize the potential for pollutants to contaminate surface or ground water or degrade soil quality.**

329 IAC 10-20-28 Self-inspections

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1

Affected: IC 13-30-2; IC 36-9-30

Sec. 28. (a) The owner, operator, or permittee of an MSWLF shall monitor and inspect the MSWLF a minimum of at least twice each month for malfunctions, deteriorations, operator errors, discharges, and leachate outcroppings that may cause a release to the environment or a threat to human health. **Inspections shall include erosion and sedimentation control measures.**

the final contour map will be necessary unless there is a change to the approved final contours.

329 IAC 10-20-26 Surface water requirements

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-3-1

Affected: IC 13-30-2; IC 36-9-30

Sec. 26. (a) The owner, operator, or permittee of an MSWLF shall not cause a discharge of pollutants into **a** waters of the state, including wetlands, that violates any requirements of **rules of the water pollution control board at 327 IAC** and the Clean Water Act, including the National Pollutant Discharge Elimination System requirements, under Section 402 of the Clean Water Act, 33 U.S.C. 1342, as amended October 31, 1992.

(b) The owner, operator, or permittee of an MSWLF shall not cause the discharge of a nonpoint source of pollution to waters of the United States, including wetlands, that violates any requirement of an area wide or statewide water quality management plan that has been approved under Section 208, 33 U.S.C. 1288, as amended February 4, 1987, or Section 319, 33 U.S.C. 1329, as added February 4, 1987, of the Clean Water Act.

(c) **Proper storage and handling of materials such as fuels or hazardous wastes, and spill prevention and cleanup measures shall be implemented to minimize the potential for pollutants to contaminate surface or ground water or degrade soil quality.**

(d) **Storage piles of sand and salt or other commercial or industrial material must be managed in a manner to reduce the potential for polluted storm water run-off and in accordance with the SWP3.**

329 IAC 10-20-28 Self-inspections

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1

Affected: IC 13-30-2; IC 36-9-30

Sec. 28. (a) The owner, operator, or permittee of an MSWLF shall monitor and inspect the MSWLF a minimum of at least twice each month for malfunctions, deteriorations, operator errors, discharges, and leachate outcroppings that may cause a release **of pollutants** to the environment or a threat to human health. **Inspections shall include erosion and sedimentation control measures.**

(b) The owner, operator, or permittee shall promptly correct any deterioration or malfunction of equipment or structures or any other problems revealed by the inspections to comply with the MSWLF's permit and this article and to ensure that no environmental or human health hazard develops. Where a hazard is imminent or has already occurred, remedial action must be taken immediately to correct or repair the hazard.

(c) The owner, operator, or permittee shall record inspections on an inspection form provided by the department or at a minimum, on a form that includes the following:

- (1) The date and time of the inspection.
- (2) The name of the inspector.
- (3) A description of the inspection, including an identification of the specific equipment and structures inspected.
- (4) The observations recorded.
- (5) The date and nature of any remedial actions implemented or repairs made as a result of the inspection.

These records must be retained at the MSWLF for at least three (3) years from the date of inspection.

329 IAC 10-21-1 General ground water monitoring requirements

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 1. (a) The owner, operator, or permittee of MSWLFs shall comply with the ground water monitoring requirements of this rule according to the following schedule:

- (1) Existing MSWLF units and lateral expansions less than or equal to two (2) miles from a drinking water surface or subsurface intake must be in compliance with the applicable ground water monitoring requirements specified in this rule by the effective date of this rule.
- (2) Existing MSWLF units and lateral expansions greater than two (2) miles from a drinking water surface or subsurface intake must be in compliance with the applicable ground water monitoring requirements specified in this rule by October 9, 1996.
- (3) New MSWLF units must be in compliance with the applicable ground water monitoring requirements specified in this rule before waste can be placed in the unit.

(b) Alternative methods, procedures, or equipment to those prescribed in this rule may be used provided the selected alternative yields results or measurements

(b) The owner, operator, or permittee shall promptly correct any deterioration or malfunction of equipment or structures or any other problems revealed by the inspections to comply with the MSWLF's permit and this article and to ensure that no environmental or human health hazard develops. Where a hazard is imminent or has already occurred, remedial action must be taken immediately to correct or repair the hazard.

(c) The owner, operator, or permittee shall record inspections on an inspection form provided by the department or at a minimum, on a form that includes the following:

- (1) The date and time of the inspection.
- (2) The name of the inspector.
- (3) A description of the inspection, including an identification of the specific equipment and structures inspected.
- (4) The observations recorded.
- (5) The date and nature of any remedial actions implemented or repairs made as a result of the inspection.

These records must be retained at the MSWLF for at least three (3) years from the date of inspection.

329 IAC 10-21-1 General ground water monitoring requirements

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 1. (a) The owner, operator, or permittee of MSWLFs shall comply with the ground water monitoring requirements of this rule according to the following schedule:

- (1) Existing MSWLF units and lateral expansions less than or equal to two (2) miles from a drinking water surface or subsurface intake must be in compliance with the applicable ground water monitoring requirements specified in this rule by ~~the effective date of this rule~~ **April 13, 1996**.
- (2) Existing MSWLF units and lateral expansions greater than two (2) miles from a drinking water surface or subsurface intake must be in compliance with the applicable ground water monitoring requirements specified in this rule by October 9, 1996.
- (3) New MSWLF units must be in compliance with the applicable ground water monitoring requirements specified in this rule before waste can be placed in the unit.

(b) Alternative methods, procedures, or equipment to those prescribed in this rule may be used provided the selected alternative yields results or measurements that

that are equivalent in accuracy and reliability and the use of the alternative is approved by the commissioner.

Alternative ground water monitoring devices or sampling devices may be approved by the commissioner if it is demonstrated that the alternative will provide results that represent ground water quality from beneath the MSWLF in an equivalent manner than could be provided by ground water monitoring wells. Regardless of location of the alternative monitoring device, the monitoring boundary, for the purposes of section 13 of this rule, must remain within fifty (50) feet of the solid waste boundary. Any such demonstration must include the following:

- (1) A complete description of the device and how it complies or differs from this section and sections 2 through 13 of this rule.**
- (2) A scientifically valid justification for any deviations from this rule.**
- (3) Any references that indicate the proficiency of the device under similar conditions.**
- (4) Provision for the construction plan for the device or devices to be approved prior to the actual construction.**
- (5) A complete description of the proposed location of the device or devices, or the methods of determining the most adequate location, including proof of the facility's control, accessibility for operations and inspections, and security of each location.**

(c) The number, spacing, and location of ground water monitoring wells **and piezometers** for an existing MSWLF must comply with the MSWLF's permit. The number, spacing, and location of ground water monitoring wells **and piezometers** for new MSWLFs must meet the requirements of 329 IAC 10-15-5.

(d) All ground water monitoring wells **and piezometers** must be affixed with permanent identification that uniquely identifies each **monitoring** well at the MSWLF. The owner, operator, or permittee shall:

- (1) number;
- (2) label; and
- (3) maintain labels;

on all ~~ground water~~ monitoring wells **and piezometers**.

(e) Ground water monitoring wells **and piezometers** must be accessible and visible at all times. Access to ~~ground water monitoring~~ wells

are equivalent in accuracy and reliability and the use of the alternative is approved by the commissioner.

(c) The number, spacing, and location of ground water monitoring wells **and piezometers** for an existing MSWLF must comply with the MSWLF's permit. The number, spacing, and location of ground water monitoring wells **and piezometers** for new MSWLFs must meet the requirements of 329 IAC 10-15-5.

(d) All ground water monitoring wells **and piezometers** must be affixed with permanent identification that uniquely identifies each **monitoring** well at the MSWLF. The owner, operator, or permittee shall:

- (1) number;
- (2) label; and
- (3) maintain labels;

on all ~~ground water~~ monitoring wells **and piezometers**.

(e) Ground water monitoring wells **and piezometers** must be accessible and visible at all times. Access to ~~ground water monitoring~~ wells through on-site roads must be available, regardless of weather conditions. Access to monitoring wells for four (4) wheel drive vehicles must be provided to ensure vehicle access throughout any season of the year. Vegetation must be controlled on the on-site roads and around **the monitoring wells and piezometers**. Access to all ~~ground water~~ monitoring wells **and piezometers** approved by the commissioner must be restricted to operating personnel, department personnel, and persons contracted by the owner, operator, or permittee to collect samples.

(f) Ground water monitoring wells, **piezometers**, and equipment must be properly maintained to ensure representative ground water samples. The owner, operator, or permittee must practice proper maintenance procedures, including the following:

- (1) Keep ~~at~~ **the ground water monitoring** wells securely capped and locked when not in use. The owner, operator, or permittee shall maintain all the caps and locks.
- (2) Make repairs as necessary to correct any wear, decay, severe corrosion, or physical damages ~~that are~~ **is** observed on or in the **ground water monitoring** well, **piezometer**, or dedicated equipment **to maintain integrity**, and submit to the commissioner documentation that the necessary repairs have been made ~~to maintain the integrity of the well~~.

through on-site roads must be available, regardless of weather conditions. Access to monitoring wells for four (4) wheel drive vehicles must be provided to ensure vehicle access throughout any season of the year. Vegetation must be controlled on the on-site roads and around the **monitoring wells and piezometers**. Access to all **ground water monitoring wells and piezometers** approved by the commissioner must be restricted to operating personnel, department personnel, and persons contracted by the owner, operator, or permittee to collect samples.

(f) Ground water monitoring wells, **piezometers**, and equipment must be properly maintained to ensure representative ground water samples. The owner, operator, or permittee must practice proper maintenance procedures, including the following:

(1) Keep ~~at~~ **the ground water monitoring wells** securely capped and locked when not in use. The owner, operator, or permittee shall maintain all the caps and locks.

(2) Make repairs as necessary to correct any wear, decay, severe corrosion, or physical damages that are observed on or in the **ground water monitoring well, piezometer**, or dedicated equipment and submit to the commissioner documentation that the necessary repairs have been made to maintain the integrity of the **monitoring well**.

(3) Maintain proper drainage around each **ground water monitoring well head by and piezometer**. **Repairs as necessary must be made to the use of a concrete pad around the protective casing apron of each well the monitoring wells to prevent water infiltration or ponding.**

(4) Control vegetation height around each of the wells. ~~as required in 329 IAC 10-20-2(d).~~

(5) Redevelop a **ground water monitoring well** that has accumulated a silt volume of ~~more than~~ **twenty percent (20%) of the screen length that may compromise the quality of the sample**. The **monitoring well** must be redeveloped prior to the next sampling event. **One (1) of the following procedures must be used to determine the need to redevelop the monitoring well:**

(A) Any regularly scheduled total depth measurement indicates that more than twenty percent (20%) of the screen length has been filled with silt. Any schedule of soundings less often than semiannually must be approved by the commissioner and based on geohydrological characteristics of the aquifer or known

(3) Maintain proper drainage around each ground water monitoring well head by and piezometer. Repairs as necessary must be made to the use of a concrete pad around the protective casing apron of each well the monitoring well to prevent water infiltration or ponding.

(4) Control vegetation height around each of the wells ~~as required in 329 IAC 10-20-2(d).~~

(5) Redevelop a **ground water monitoring well** that has accumulated a silt volume of ~~more than twenty percent (20%) of the screen length that may compromise the quality of the sample~~. The **monitoring well** must be redeveloped prior to the next sampling event. **One (1) of the following procedures must be used to determine the need to redevelop the monitoring well:**

(A) Any regularly scheduled total depth measurement that indicates more than twenty percent (20%) of the screen length has been filled with silt. Any schedule of soundings less often than semi-annually must be approved by the commissioner and based on geohydrological characteristics of the aquifer or known rate of down-hole siltation.

(B) Semi-annual field tests that indicate an order-of-magnitude rise in turbidity or total solids for sampling points using dedicated submersed equipment.

(C) Any other equivalent procedure that has been approved by the commissioner.

(g) If a ground water monitoring well or a **piezometer** is destroyed or otherwise fails to properly function, the owner, operator, or permittee must comply with the following requirements:

(1) The owner, operator, or permittee shall provide the commissioner with a written report within ten (10) days of discovering that the **ground water monitoring well or piezometer** is destroyed or not properly functioning. The report must include the following information:

(A) The date of discovery that a **ground water monitoring well or piezometer** is destroyed or is not properly functioning.

(B) The probable cause of **ground water monitoring well or piezometer** destruction, damage, or malfunction.

(C) A proposed repair or replacement plan, in accordance with ~~subdivision (2) or the following~~ and with section 4 of this rule, that is subject to the commissioner's approval.

(i) If the ground water monitoring well or piezometer is repaired, the following requirements must be fulfilled:

rate of down-hole siltation.

(B) Semiannual field tests indicate an order-of-magnitude rise in turbidity or suspended solids for sampling points using dedicated submersed equipment.

(C) Any other procedure that has been approved by the commissioner.

(g) If a ground water monitoring well **or a piezometer** is destroyed or otherwise fails to properly function, the owner, operator, or permittee must comply with the following requirements:

(1) The owner, operator, or permittee shall provide the commissioner with a written report within ten (10) days of discovering that the **ground water monitoring well or piezometer** is destroyed or not properly functioning. The report must include the following information:

(A) The date of discovery that a **ground water monitoring well or piezometer** is destroyed or is not properly functioning.

(B) The probable cause of **ground water monitoring well or piezometer** destruction, damage, or malfunction.

(C) A proposed repair or replacement plan, in accordance with subdivision (2) and with section 4 of this rule, that is subject to the commissioner's approval.

(2) Within thirty (30) days after receiving the commissioner's approval of the plan submitted under subdivision (1)(C), the **ground water monitoring well or piezometer** must be repaired or replaced in accordance with the following:

(A) If the **ground water monitoring well or piezometer** is repaired, the following requirements must be fulfilled:

(i) The owner, operator, or permittee shall submit to the commissioner a description of the repair methods.

(ii) The owner, operator, or permittee shall submit to the commissioner the revised design and construction diagram.

(B) If the ground water monitoring well **or piezometer** is replaced, the following requirements must be fulfilled:

(i) The original ground water monitoring well **or piezometer** must be properly abandoned in accordance with subsection (i).

(ii) A description of installation methods for the replacement of all pertinent ground water monitoring

(aa) The owner, operator, or permittee shall submit to the commissioner a description of the repair methods.

(bb) The owner, operator, or permittee shall submit to the commissioner the revised design and construction diagram.

(ii) If the ground water monitoring well **or piezometer** is replaced, the following requirements must be fulfilled:

(aa) The original ground water monitoring well **or piezometer** must be properly abandoned in accordance with subsection (i).

(bb) A description of installation methods for the replacement of all pertinent ground water monitoring wells **or piezometers**, a monitoring well and piezometer design and construction diagram, and the borehole drilling log must be submitted to the commissioner.

(cc) Replacement ground water monitoring wells **or piezometers** must meet the design requirements of section 4 of this rule

(dd) Replacement ground water monitoring wells **or piezometers** constructed within fifteen (15) feet of the original monitoring well **or piezometer** may have earthen material sampling and earthen material sample testing requirements waived by the commissioner if the original ground water monitoring well **or piezometer** earthen material sampling and earthen material sample testing complies with section 4 of this rule.

(2) Within thirty (30) days after receiving the commissioner's approval of the plan submitted under subdivision (1)(C), the **ground water monitoring well or piezometer** must be repaired or replaced in accordance with the following: **approved plan.**

~~(A) If the well is repaired, the following requirements must be fulfilled:~~

~~(i) The owner, operator, or permittee shall submit to the commissioner a description of the repair methods.~~

~~(ii) The owner, operator, or permittee shall submit to the commissioner the revised design and construction diagram.~~

wells **or** piezometers, a **monitoring well and piezometer** design and construction diagram, and the borehole drilling log must be submitted to the commissioner.

(iii) **Replacement ground water monitoring wells or piezometers must meet the design requirements of section 4 of this rule.**

(iv) **Replacement ground water monitoring wells or piezometers constructed within fifteen (15) feet of the original monitoring well or piezometers may have earthen material sampling and earthen material sample testing requirements waived if:**

(AA) the original ground water monitoring well or piezometer earthen material sampling and earthen material sample testing complies with section 4 of this rule; and
(BB) the waiver is approved by the commissioner.

(3) If discovery of a **ground water monitoring well or piezometer** failure coincides with the time of a scheduled sampling event, the failed monitoring well **or piezometer** must be sampled immediately after it has been repaired or replaced.

(h) The owner, operator, or permittee shall abandon and replace a ground water monitoring well if:

- (1) the ground water monitoring well has a permeable or semipermeable annular sealant; or
- (2) any of the following details of the ground water **monitoring** well construction are not available:

- (A) Screened interval.
- (B) Annular sealant material.
- (C) Borehole and casing diameters.
- (D) Casing and screen material.
- (E) Ground elevation and the reference mark elevation.
- (F) Outside casing diameter and depth.
- (G) Filter pack material.

(i) The owner, operator, or permittee shall notify the commissioner in writing and obtain written approval to decommission or abandon any ground water monitoring well **and piezometer**. Abandonment procedures must comply with the following:

(1) Abandonment procedures must be:

~~(ii) The owner, operator, or permittee shall submit to the commissioner the revised design and construction diagram.~~

~~(B) If the ground water monitoring well is replaced, the following requirements must be fulfilled:~~

~~(i) The original ground water monitoring well must be properly abandoned in accordance with subsection (i).~~

~~(ii) A description of installation methods for the replacement of all pertinent ground water monitoring wells, a well design and construction diagram, and the borehole drilling log must be submitted to the commissioner.~~

(3) If discovery of a **ground water monitoring well or piezometer** failure coincides with the time of a scheduled sampling event, the failed monitoring well **or piezometer** must be sampled immediately after it has been repaired or replaced.

(h) The owner, operator, or permittee shall abandon and replace a ground water monitoring well if:

- (1) the ground water monitoring well has a permeable or semipermeable annular sealant; or
- (2) any of the following details of the ground water **monitoring** well construction are not available:

- (A) Screened interval.
- (B) Annular sealant material.
- (C) Borehole and casing diameters.
- (D) Casing and screen material.
- (E) Ground elevation and the reference mark elevation.
- (F) Outside casing diameter and depth.
- (G) Filter pack material.

(i) The owner, operator, or permittee shall notify the commissioner in writing and obtain written approval to decommission or abandon any ground water monitoring well **or piezometer**. Abandonment procedures must comply with the following:

(1) Abandonment procedures must be:

- (A) in compliance with ~~310 IAC 16-10-2~~ **rules of the department of natural resources commission at 312 IAC 13-10-2**; or
- (B) an alternative procedure approved by the commissioner **that provides equivalent environmental protection.**

(2) Methods of abandonment must ensure that slurry does not bridge or become obstructed and that the borehole is completely sealed.

- (A) in compliance with ~~310 IAC 16-10-2~~ **312 IAC 13-10-2** of the department of natural resources; or
- (B) an alternative procedure approved by the commissioner.
- (2) Methods of abandonment must ensure that slurry does not bridge or become obstructed and that the borehole is completely sealed.
- (3) Attempts must be made to remove the entire casing from the **ground water monitoring well or piezometer** to be abandoned, if there is evidence that the integrity of the annulus between the borehole and **monitoring well or piezometer** casing has been compromised.
- (4) Accurate records of the location and abandonment procedures must be maintained in the operating records.
- (j) All ground water monitoring wells that have been approved by the commissioner must be used to obtain ground water to be analyzed for the purpose of this rule.
- (k) The commissioner may require additional ground water monitoring wells **and piezometers** during the active life, closure, or post-closure care period of the MSWLF if:
- (1) ground water flow data indicate that ground water flow directions are other than anticipated in the ground water monitoring system design;
 - (2) further evaluation of the hydrogeology of the MSWLF determines that additional **ground water monitoring wells or piezometers** are needed; or
 - (3) additional **ground water monitoring wells and piezometers** are necessary to achieve compliance with ground water monitoring standards under 329 IAC 10-15-5.
- (l) The ground water monitoring boundary must be located:
- (1) within the property line; and
 - (2) within fifty (50) feet of the solid waste boundary that has been approved by the commissioner for final closure, except where fifty (50) feet is not possible because of physical obstacles or geology. If the owner, operator, or permittee chooses to use intrawell comparison procedures to evaluate the ground water data, the monitoring boundary shall be considered to be at the location of each ground water monitoring well designated for the detection monitoring program.
- (m) The number of independent ground water
- (3) Attempts must be made to remove the entire casing from the **ground water monitoring well or piezometer** to be abandoned; if there is evidence that the integrity of the annulus between the borehole and **monitoring well or piezometer** casing has been compromised.
- (4) Accurate records of the location **of the ground water monitoring well or piezometer** and the abandonment procedures must be maintained in the operating records.
- (j) All ground water monitoring wells that have been approved by the commissioner must be used to obtain ground water to be analyzed for the purpose of this rule.
- (k) The commissioner may require additional ground water monitoring wells **and piezometers** during the active life, closure, or post-closure care period of the MSWLF if:
- (1) ground water flow data indicate that ground water flow directions are other than anticipated in the ground water monitoring system design;
 - (2) further evaluation of the hydrogeology of the MSWLF determines that additional **ground water monitoring wells or piezometers** are needed; or
 - (3) additional **ground water monitoring wells and piezometers** are necessary to achieve compliance with ground water monitoring standards under 329 IAC 10-15-5.
- (l) The ground water monitoring boundary must be located:
- (1) within the **real property line boundary**; and
 - (2) within fifty (50) feet of the solid waste boundary that has been approved by the commissioner for final closure, except where fifty (50) feet is not possible because of physical obstacles or geology. If the owner, operator, or permittee chooses to use intrawell comparison procedures to evaluate the ground water data, the monitoring boundary shall be considered to be at the location of each ground water monitoring well designated for the detection monitoring program.
- (m) The number of independent ground water samples collected to establish background ground water quality data must be consistent with the appropriate statistical procedures in accordance with section 6 of this rule.
- (n) Background ground water quality may be established at ground water monitoring wells that are

samples collected to establish background ground water quality data must be consistent with the appropriate statistical procedures in accordance with section 6 of this rule.

(n) Background ground water quality may be established at ground water monitoring wells that are not located hydraulically upgradient from the MSWLF solid waste boundary if, as determined by the commissioner:

- (1) hydrogeologic conditions do not allow the owner, operator, or permittee to determine which **ground water monitoring** wells are hydraulically upgradient; or
- (2) sampling at other **ground water monitoring** wells will provide an indication of background water quality that is as representative or more representative than that provided by the upgradient **monitoring** wells.

(o) If contamination is detected in any ground water monitoring well used to establish background ground water quality, the contamination must be investigated, within the MSWLF's facility boundary, to the extent necessary to determine that the MSWLF is not the cause of contamination. If an investigation reveals that the contamination is caused by one (1) or more MSWLF units within the MSWLF, the owner, operator, or permittee must:

- (1) further assess and investigate the contamination, as specified under section 10 of this rule; and
- (2) use any **ground water** monitoring well in which the contamination is detected as a downgradient **monitoring** well in all ground water monitoring programs.

(p) Each time ground water samples are collected from ground water monitoring wells at the monitoring boundary, the owner, operator, or permittee shall prepare and submit to the commissioner ground water potentiometric-surface maps, or flow maps, of the aquifer being monitored at the site. Except for subdivisions (5), (11), and ~~(13)~~ **(12)**, which may be presented in tabular form accompanying the maps, each map must indicate the following:

- (1) A clear identification of the contour interval for the potentiometric-surface or water table surface of each aquifer being monitored at the MSWLF.
- (2) The ground water monitoring wells **and piezometers**:

(A) considered to be upgradient **and**

not located hydraulically upgradient from the MSWLF solid waste boundary if, as determined by the commissioner:

- (1) hydrogeologic conditions do not allow the owner, operator, or permittee to determine which **ground water monitoring** wells are hydraulically upgradient; or
- (2) sampling at other **ground water monitoring** wells will provide an indication of background water quality that is as representative or more representative than that provided by the upgradient **monitoring** wells.

(o) If contamination is detected in any ground water monitoring well used to establish background ground water quality, the contamination must be investigated, within the MSWLF's facility boundary, to the extent necessary to determine that the MSWLF is not the cause of contamination. If an investigation reveals that the contamination is caused by one (1) or more MSWLF units within the MSWLF, the owner, operator, or permittee must:

- (1) further assess and investigate the contamination, as specified under section 10 of this rule; and
- (2) use any **ground water** monitoring well in which the contamination is detected as a downgradient **monitoring** well in all ground water monitoring programs.

(p) Each time ground water samples are collected from ground water monitoring wells at the monitoring boundary, the owner, operator, or permittee shall prepare and submit to the commissioner ground water potentiometric-surface maps, or flow maps, of the aquifer being monitored at the site. Except for subdivisions (5), (11), and ~~(13)~~ **(12)**, which may be presented in tabular form accompanying the maps, each map must indicate the following:

- (1) A clear identification of the contour interval for the potentiometric-surface or water table surface of each aquifer being monitored at the MSWLF.
- (2) The ground water monitoring wells **and piezometers**:

- (A) considered to be upgradient **and background**;
 - (B) considered to be downgradient; and
 - (C) for which there has been no determination due to the hydrogeologic complexities.
- (3) Each ground water monitoring well's identification and location.
 - (4) Each piezometer's identification and location.

background;

(B) considered to be downgradient; and
(C) for which there has been no determination due to the hydrogeologic complexities.

(3) Each ground water monitoring well's identification and location.

(4) Each piezometer's identification and location.

(5) The static water elevations at each ground water monitoring well, referenced to mean sea level and measured to the nearest one-hundredth (0.01) foot.

(6) Real property boundaries, facility boundaries, and the solid waste boundaries.

(7) The identification of each aquifer through either its title or its elevation.

(8) The MSWLF's name and county.

(9) The map scale and a north arrow.

(10) Ground water flow arrows.

(11) The date and time of the measurements for each of the **ground water monitoring wells and piezometers**.

(12) The elevation of the ground surface and the top of the casing at each **ground water monitoring well** and piezometer. The elevation of the referenced mark located on top of the casing of each ground water monitoring well and piezometer must be surveyed to the nearest plus or minus one-hundredth (± 0.01) foot. The referenced mark must be used to measure static water levels.

(13) The following information, upon request by the commissioner:

(A) An updated site surface topography and surface water drainage patterns as described under 329 IAC 10-15-4(b)(12) if the potentiometric surface being evaluated is influenced by surface topography.

(B) All water wells and surface water bodies used as a drinking water source within one-fourth ($\frac{1}{4}$) mile of the solid waste boundary.

(C) Any other information the commissioner determines to be necessary, **including ground water flow gradient and velocity**, to evaluate the map information.

(14) Unless the commissioner deems necessary, potentiometric surface maps are not required to be submitted for the following reasons:

(A) When very few ground water monitoring wells are required to be sampled to establish background for the constituents listed in Table 1A under section 15(a) of this rule.

(B) When very few ground water

(5) The static water elevations at each ground water monitoring well, referenced to mean sea level and measured to the nearest one-hundredth (0.01) foot.

(6) Real property boundaries, facility boundaries, and the solid waste boundaries.

(7) The identification of each aquifer through either its title or its elevation.

(8) The MSWLF's name and county.

(9) The map scale and a north arrow.

(10) Ground water flow arrows.

(11) The date and time of the measurements for each of the **ground water monitoring wells and piezometers**.

(12) The elevation of the ground surface and the top of the casing at each **ground water monitoring well** and piezometer. The elevation of the referenced mark located on top of the casing of each ground water monitoring well and piezometer must be surveyed to the nearest plus or minus one-hundredth (± 0.01) foot. The referenced mark must be used to measure static water levels.

(13) The following information, upon request by the commissioner:

(A) An updated site surface topography and surface water drainage patterns as described under 329 IAC 10-15-4(b)(12) if the potentiometric surface being evaluated is influenced by surface topography.

(B) All water wells and surface water bodies used as a drinking water source within one-fourth ($\frac{1}{4}$) mile of the solid waste boundary.

(C) Any other information the commissioner determines to be necessary, **including ground water flow gradient and velocity**, to evaluate the map information.

(14) Unless the commissioner deems necessary based on hydrogeological conditions, data for potentiometric surface maps of the entire site are not required to be collected if one or more of the following exist:

(A) When very few ground water monitoring wells are required to be sampled to establish background for the constituents listed in Table 1A under section 15(a) of this rule.

(B) When very few ground water monitoring wells need to be sampled to verify a preliminary exceedance.

(C) When very few ground water monitoring wells are required to be sampled under section 10(b)(1) or 10(e) of this rule.

monitoring wells need to be sampled to verify a preliminary exceedance.

(C) When very few ground water monitoring wells are required to be sampled under section 10(b)(1) or 10(e) of this rule.

(D) When very few ground water monitoring wells need to be sampled to establish background under section 10(b)(4) of this rule.

(q) Ground water must be monitored as required in sections 7, 10, and 13 of this rule. The sampling frequency must be as specified under:

- (1) section 7 of this rule for detection monitoring;
- (2) section 10 of this rule for assessment monitoring; and
- (3) section 13 of this rule for corrective action.

~~(r) All ground water monitoring wells that are so specified by the commissioner must have ground water samples collected and analyzed for the constituents identified in Table 1A, Table 1B, or Table 2, whichever is applicable. Ground water sampling must be done semiannually or at another frequency specified by the commissioner.~~

~~(s)~~ (r) Each time ground water samples are collected from ground water monitoring wells at the monitoring boundary, the following requirements for static water elevations must be:

- (1) Obtained from each ground water monitoring well and each piezometer **required to be sampled for the applicable ground water monitoring program.**
- (2) Measured to the nearest one-hundredth (0.01) foot, and referenced to mean sea level.
- (3) Obtained as close in time as practical from each **ground water monitoring** well or piezometer prior to purging and sampling each **ground water monitoring** well. If such a purging and collection sequence is expected to affect the accuracy of the static water elevation measurements in any **ground water monitoring** well or piezometer in the ground water monitoring system, then water elevation measurements must be obtained prior to purging and sampling any **ground water monitoring** well.

~~(t)~~ (s) The owner, operator, or permittee shall submit the following information to the commissioner within sixty (60) days of obtaining the ground water samples in a sampling event unless a verification

(D) When very few ground water monitoring wells need to be sampled to establish background under section 10(b)(4) of this rule.

(q) Ground water must be monitored as required in sections 7, 10, and 13 of this rule. The sampling frequency must be as specified under:

- (1) section 7 of this rule for detection monitoring;
- (2) section 10 of this rule for assessment monitoring; and
- (3) section 13 of this rule for corrective action.

~~(r) All ground water monitoring wells that are so specified by the commissioner must have ground water samples collected and analyzed for the constituents identified in Table 1A, Table 1B, or Table 2, whichever is applicable. Ground water sampling must be done semiannually or at another frequency specified by the commissioner.~~

~~(s)~~ (r) Each time Ground water samples are collected from ground water monitoring wells at the monitoring boundary, the following requirements for static water elevations must **always** be:

- (1) Obtained from each ground water monitoring well and each piezometer **required to be sampled for the applicable ground water monitoring program.**
- (2) Measured to the nearest one-hundredth (0.01) foot, and referenced to mean sea level.
- (3) Obtained as close in time as practical from each **ground water monitoring** well or piezometer prior to purging and sampling ~~each well~~. If such a purging and collection sequence is expected to affect the accuracy of the static water elevation measurements in any **other ground water monitoring** well or piezometer in the ground water monitoring system, then water elevation measurements must be obtained **from all ground water monitoring wells and piezometers** prior to purging and sampling any **ground water monitoring** well.

~~(t)~~ (s) The owner, operator, or permittee shall submit the following information to the commissioner within sixty (60) days of obtaining the ground water samples in a sampling event unless a verification sampling program, as described in section 8 of this rule, is implemented:

- (1) All static water elevations measured to the nearest one-hundredth (0.01) foot.
- (2) Ground water potentiometric-surface maps, or flow maps, as specified in subsection (p).

sampling program, as described in section 8 of this rule, is implemented:

- (1) All static water elevations measured to the nearest one-hundredth (0.01) foot.
- (2) Ground water potentiometric-surface maps, or flow maps, as specified in subsection (p).
- (3) Two (2) unbound laboratory certified reports, including one (1) original copy, that include the following information **unless otherwise specified by the commissioner:**

- (A) The detection limit for each chemical constituent.
 - (B) The date samples were collected.
 - (C) The date samples were received by the laboratory.
 - (D) The date samples were analyzed by the laboratory.
 - (E) The date the laboratory report was prepared.
 - (F) The method of analysis used for each constituent.
 - (G) The sample identification number for each sample.
 - (H) The results of all sample analyses.
- (4) Field report sheets as described under section 2(b)(12) of this rule for each ground water monitoring well sampled and the field chain of custody form for each sample as described under section 2(b)(14) of this rule.
 - (5) A report correlating sample identification numbers with the corresponding **ground water monitoring** well identification number and blank identification numbers.
 - (6) An explanation of how the **ground water monitoring** well sampling sequence as described under section 2(a)(6) of this rule was established for the sampling event.
 - (7) **Two (2) copies of** the statistical evaluation reports as described under section 6(e) of this rule.
 - ~~(8) When requested by the commissioner, one (1) copy of the results of the laboratory analyses on computer diskette or by other electronic means must be submitted to the commissioner. The electronic format of the submission will be established by the commissioner.~~
 - ~~(9)~~ **(8)** When requested by the commissioner, the following information:
 - (A) The results of all laboratory quality control sample analyses, including:
 - (i) blanks;
 - (ii) spikes;
 - (iii) duplicates; and
 - (iv) standards.

- (3) Two (2) unbound laboratory certified reports, including one (1) original copy, that include the following information **unless otherwise specified by the commissioner:**

- (A) The detection limit for each chemical constituent.
 - (B) The date samples were collected.
 - (C) The date samples were received by the laboratory.
 - (D) The date samples were analyzed by the laboratory.
 - (E) The date the laboratory report was prepared.
 - (F) The method of analysis used for each constituent.
 - (G) The sample identification number for each sample.
 - (H) The results of all sample analyses.
- (4) Field report sheets as described under section 2(b)(12) of this rule for each ground water monitoring well sampled and the field chain of custody form for each sample as described under section 2(b)(14) of this rule.
 - (5) A report correlating sample identification numbers with the corresponding **ground water monitoring** well identification number and blank identification numbers.
 - (6) An explanation of how the **ground water monitoring** well sampling sequence as described under section 2(a)(6) of this rule was established for the sampling event.
 - (7) **Two (2) copies of** the statistical evaluation reports as described under section 6(e) of this rule.
 - ~~(8) When requested by the commissioner, one (1) copy of the results of the laboratory analyses on computer diskette or by other electronic means must be submitted to the commissioner. The electronic format of the submission will be established by the commissioner.~~
 - ~~(9)~~ **(8)** When requested by the commissioner, the following information:
 - (A) The results of all laboratory quality control sample analyses, including:
 - (i) blanks;
 - (ii) spikes;
 - (iii) duplicates; and
 - (iv) standards.
 - (B) Raw data.
 - (C) Laboratory bench sheets.
 - (D) Laboratory work sheets.
 - (E) Chromatograms.
 - (F) Instrument printouts.
 - (G) Instrument calibration records.

- (B) Raw data.
- (C) Laboratory bench sheets.
- (D) Laboratory work sheets.
- (E) Chromatograms.
- (F) Instrument printouts.
- (G) Instrument calibration records.

(t) (t) Detection monitoring must be conducted throughout the active life, closure, and post-closure periods of the MSWLF.

329 IAC 10-21-2 Sampling and analysis plan and program

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 2. (a) The owner, operator, or permittee shall carry out a ground water sampling and analysis program that is specified in an approved sampling and analysis plan, and that complies with the requirements of this rule. The sampling and analysis plan must address all items included in this section, where applicable, and it must satisfy the following requirements:

- (1) For all new MSWLFs permitted under this article, the sampling and analysis plan must be approved by the commissioner before the first sampling event occurs.
- (2) Existing MSWLFs that have not previously submitted an approved sampling and analysis plan that includes all applicable requirements of this section, must have a plan approved by the commissioner by one (1) of the following times, whichever occurs first:
 - (A) At the time of the next permit renewal application.
 - (B) At closure.
 - (C) At a time determined by the commissioner.
- (3) Existing MSWLFs that have, by the effective date of this article, submitted to the commissioner an approved sampling and analysis plan that does not include all applicable requirements of this rule, must submit a revised plan, if deemed necessary by the commissioner, by one (1) of the following times, whichever occurs first:
 - (A) At the time of the next permit renewal application.
 - (B) At closure.
 - (C) At a time determined by the commissioner.
- (4) Changes or additions to a previously approved sampling and analysis plan must be approved by the commissioner before the changes or additions

(t) (t) Detection monitoring must be conducted throughout the active life, closure, and post-closure periods of the MSWLF.

329 IAC 10-21-2 Sampling and analysis plan and program

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 2. (a) The owner, operator, or permittee shall carry out a ground water sampling and analysis program that is specified in an approved sampling and analysis plan, and that complies with the requirements of this rule. The sampling and analysis plan must address all items included in this section, where applicable, and it must satisfy the following requirements:

- (1) For all new MSWLFs permitted under this article, the sampling and analysis plan must be approved by the commissioner before the first sampling event occurs.
- (2) Existing MSWLFs that have not previously submitted an approved sampling and analysis plan that includes all applicable requirements of this section, must have a plan approved by the commissioner by one (1) of the following times, whichever occurs first:
 - (A) At the time of the next permit renewal application.
 - (B) At closure.
 - (C) At a time determined by the commissioner **based on information supplied by the MSWLF.**
- (3) Existing MSWLFs that have, by ~~the effective date of this article~~ **April 13, 1996**, submitted to the commissioner an approved sampling and analysis plan that does not include all applicable requirements of this rule, must submit a revised plan, if deemed necessary by the commissioner, by one (1) of the following times, whichever occurs first:
 - (A) At the time of the next permit renewal application.
 - (B) At closure.
 - (C) At a time determined by the commissioner **based on information supplied by the MSWLF.**

are implemented.

(5) The approved sampling and analysis plan must be retained at or near the MSWLF in the operating record or at an alternative location approved by the commissioner.

(6) The sampling and analysis plan must include the following:

(A) A description of the following:

(i) The method that will be used to determine the sequence of sampling of ground water monitoring wells. The sequence determination must:

(AA) compare **ground water monitoring** wells that are not contaminated to those that are contaminated or to those that have the potential to be contaminated; and

(BB) follow the criteria described under subsection (b)(8).

(ii) The method of evacuation, including:

(AA) a description of the equipment and procedures to be used;

(BB) the method for calculating one (1) well volume at each well; and

(CC) the method for measuring the volume of water evacuated.

(iii) The equipment and procedures to be used in sample collection during detection, assessment, and corrective action ground water monitoring programs, including, but not limited to:

(AA) the sizes, number, and material of containers to be used for collection of samples; and
(BB) the manufacturer, make, and model number of field meters for pH, Eh, and specific conductance.

(iv) Copies of the owner's manual for each type of meter used in the sampling procedures.

(B) The qualifications and minimum training that the owner, operator, or permittee will require of the ground water sampler or sampling crew.

(b) The sampling and analysis program and procedures must comply with the following:

(4) Changes or additions to a previously approved sampling and analysis plan must be approved by the commissioner before the changes or additions are implemented.

(5) The approved sampling and analysis plan must be retained at or near the MSWLF in the operating record or at an alternative location approved by the commissioner.

(6) The sampling and analysis plan must include the following:

(A) A description of the following:

(i) The method that will be used to determine the sequence of sampling of ground water monitoring wells. The sequence determination must:

(AA) compare **ground water monitoring** wells that are not contaminated to those that are contaminated or to those that have the potential to be contaminated; and
(BB) follow the criteria described under subsection (b)(8).

(ii) The method of evacuation, including:

(AA) a description of the equipment and procedures to be used;

(BB) the method for calculating one (1) well volume at each well; and
(CC) the method for measuring the volume of water evacuated.

(iii) The equipment and procedures to be used in sample collection during detection, assessment, and corrective action ground water monitoring programs, including, but not limited to:

(AA) the sizes, number, and material of containers to be used for collection of samples; and

(BB) the manufacturer, make, and model number of field meters for pH, Eh (**Oxidation-Reduction Potential**), and specific conductance.

(iv) Copies of the owner's manual for each type of meter used in the sampling procedures.

(B) The qualifications and minimum training that the owner, operator, or permittee will require of the ground water sampler or sampling crew.

(b) The sampling and analysis program and procedures must comply with the following:

(1) The sampling crew shall:

- (1) The sampling crew shall:
- ~~(A) comply with requirements of state and federal agencies regarding worker safety;~~
 - ~~(B)~~ (A) wear latex gloves, vinyl gloves, or gloves made out of alternative material that has been approved by the commissioner whenever the samplers' hands are in proximity of:
 - (i) sample water;
 - (ii) open sample containers;
 - (iii) sampling equipment; or
 - (iv) the open **monitoring** well; and
 - ~~(C)~~ (B) avoid contact between gloves and samples.
- (2) Each time ground water samples are collected from ground water monitoring wells at the monitoring boundary, **regardless of whether a map is produced as exempted in section 1(p)(14) of this rule**, static water elevations must be:
- (A) obtained from each **ground water** monitoring well and each piezometer;
 - (B) measured to the nearest one-hundredth (0.01) foot, and referenced to mean sea level; and
 - (C) obtained as close in time as practical from each **ground water monitoring** well or piezometer prior to purging and sampling each **ground water monitoring** well.
- If such a purging and collection sequence is expected to affect the accuracy of the static water elevation measurements in any other **ground water monitoring** well or piezometer in the ground water monitoring system, then water elevation measurements must be obtained prior to purging and sampling any **ground water monitoring** well.
- (3) Samples that are to be analyzed for dissolved metals must be field filtered immediately after the sample is obtained from the **ground water** monitoring well using a forty-five hundredths (0.45) micron high capacity filter. Use of an alternative filter type or filter size must be approved by the commissioner.
- (4) Static water in the **ground water** monitoring well must be removed with equipment that does not:
- (A) cause the water to cascade over the **ground water monitoring** well screen; or
 - (B) cause strong gradients or excess volatilization of organic compounds in the ground water.
- (5) The method of evacuation must be suited to the recharge of the ground water monitoring well, the

~~(A) comply with requirements of state and federal agencies regarding worker safety;~~

~~(B)~~ (A) wear latex gloves, vinyl gloves, or gloves made out of alternative material that has been approved by the commissioner whenever the samplers' hands are in proximity of:

- (i) sample water;
- (ii) open sample containers;
- (iii) sampling equipment; or
- (iv) the open **monitoring** well; and

~~(C)~~ (B) avoid contact between gloves and samples.

(2) Each time ground water samples are collected from ground water monitoring wells at the monitoring boundary static water elevations must be:

(A) obtained from each **ground water** monitoring well ~~and each piezometer where a sample has been collected;~~

(B) measured to the nearest one-hundredth (0.01) foot, and referenced to mean sea level; and

(C) obtained as close in time as practical from each **ground water monitoring** well or piezometer prior to purging and sampling ~~each well.~~

If such a purging and collection sequence is expected to affect the accuracy of the static water elevation measurements in any other **ground water monitoring** well or piezometer in the ground water monitoring system, then water elevation measurements must be obtained **from all ground water monitoring wells and piezometers** prior to purging and sampling any **ground water monitoring** well.

(3) Samples that are to be analyzed for dissolved metals must be field filtered immediately after the sample is obtained from the **ground water** monitoring well using a forty-five hundredths (0.45) micron high capacity filter. Use of an alternative filter type or filter size must be approved by the commissioner.

(4) Static water in the **ground water** monitoring well must be removed with equipment that does not:

- (A) cause the water to cascade over the **ground water monitoring** well screen; or
- (B) cause strong gradients or excess volatilization of organic compounds in the ground water.

(5) The method of evacuation must be suited to the recharge of the ground water monitoring well, the well depth, and the well diameter, and must comply with one (1) of the following:

well depth, and the well diameter, and must comply with one (1) of the following:

(A) Evacuation may be accomplished with a pump. If a pump is used, the following requirements must be satisfied:

- (i) The intake of the pump must be placed within, and ground water must be withdrawn from, the screened interval of the **ground water monitoring** well.
- (ii) Purging with a pump must continue until a minimum of three (3) well volumes has been evaluated or the field constituents of pH, specific conductance, and temperature are stabilized within ten percent (10%) of a field determined mean reading for three (3) consecutive field readings to be completed as follows:
 - (AA) A minimum of six (6) samples must be taken for the required parameters.
 - (BB) Three (3) consecutive samples must be used to arrive at the field determined mean reading, and each of the next three (3) samples must be within ten percent (10%) of the field determined mean.
 - (CC) In the event that one (1) or more of the last three (3) samples are not within ten percent (10%) of the mean, the first sample will be deleted and a new field mean will be calculated from the next three (3) consecutive samples.
 - (DD) Additional samples are taken and the process described under subitem (CC) is continued until three (3) consecutive samples agree within ten percent (10%) of the field mean determined by the three (3) previous consecutive samples.
 - (EE) Purging a **monitoring** well by more than five (5) well volumes is prohibited.
- (iii) When removing water from the **ground water monitoring** well for obtaining a sample, the pump must not be raised or lowered unless the potentiometric surface is as low as or

(A) Evacuation may be accomplished with a pump. If a pump is used, the following requirements must be satisfied:

- (i) The intake of the pump must be placed within, and ground water must be withdrawn from, the screened interval of the **ground water monitoring** well.
- (ii) Purging with a pump must continue until a minimum of three (3) well volumes has been evaluated or the field constituents of pH, specific conductance, and temperature are stabilized within ten percent (10%) of a field determined mean reading for three (3) consecutive field readings to be completed as follows:
 - (AA) A minimum of six (6) samples must be taken for the required parameters.
 - (BB) Three (3) consecutive samples must be used to arrive at the field determined mean reading, and each of the next three (3) samples must be within ten percent (10%) of the field determined mean.
 - (CC) In the event that one (1) or more of the last three (3) samples are not within ten percent (10%) of the mean, the first sample will be deleted and a new field mean will be calculated from the next three (3) consecutive samples.
 - (DD) Additional samples are taken and the process described under subitem (CC) is continued until three (3) consecutive samples agree within ten percent (10%) of the field mean determined by the three (3) previous consecutive samples.
 - (EE) Purging a **monitoring** well by more than five (5) well volumes is prohibited.
- (iii) When removing water from the **ground water monitoring** well for obtaining a sample, the pump must not be raised or lowered unless the potentiometric surface is as low as or lower than the top of the well screen.
- (iv) A **ground water monitoring** well purged by a pump must be sampled by the same pump unless otherwise approved by the commissioner.

lower than the top of the well screen.

(iv) A **ground water monitoring** well purged by a pump must be sampled by the same pump unless otherwise approved by the commissioner.

(v) If the permittee chooses to use a rotary pump, it must be used in accordance with the following:

(AA) The flow must be maintained at a slow and steady rate.

(BB) If the flow of water is intermixed with air during the use of the rotary pump, the pump must be lowered deeper into the water column or the sample collection must be accomplished with a bottom discharging bailer.

(CC) The interior of the pump must be coated with Teflon® or an inert material equivalent to Teflon® or be composed of stainless steel.

(vi) If the permittee chooses to use a positive gas displacement pump, it must be used in accordance with the following:

(AA) The flow must not be at a rate that forcefully ejects water or gas at the end of the expulsion cycle.

(BB) The generator must be placed downwind at least ten (10) feet from the **ground water monitoring** well being ~~monitored:~~ **sampled.**

(vii) If the permittee chooses to use a peristaltic pump, it must be used in accordance with the following:

(AA) The peristaltic pump must only be used in a **ground water monitoring** well with a depth of thirty-three (33) feet or less.

(BB) Historical data and tubing manufacturer data sheets must be utilized to select the proper tubing for each site.

(CC) Water in the tubes must be evacuated between **ground water monitoring** wells.

(DD) The tubes must be decontaminated between **ground water monitoring** wells.

(v) If the permittee chooses to use a rotary pump, it must be used in accordance with the following:

(AA) The flow must be maintained at a slow and steady rate.

(BB) If the flow of water is intermixed with air during the use of the rotary pump, the pump must be lowered deeper into the water column or the sample collection must be accomplished with a bottom discharging bailer.

(CC) The interior of the pump must be coated with Teflon® or an inert material equivalent to Teflon® or be composed of stainless steel.

(vi) If the permittee chooses to use a positive gas displacement pump, it must be used in accordance with the following:

(AA) The flow must not be at a rate that forcefully ejects water or gas at the end of the expulsion cycle.

(BB) The generator must be placed downwind at least ten (10) feet from the **ground water monitoring** well being ~~monitored:~~ **sampled.**

(vii) If the permittee chooses to use a peristaltic pump, it must be used in accordance with the following:

(AA) The peristaltic pump must only be used in a **ground water monitoring** well with a depth of thirty-three (33) feet or less.

(BB) Historical data and tubing manufacturer data sheets must be utilized to select the proper tubing for each site.

(CC) Water in the tubes must be evacuated ~~between~~ **after each ground water monitoring wells is sampled.**

(DD) The tubes must be decontaminated ~~between~~ **after each ground water monitoring wells is sampled.**

(B) Evacuation may be accomplished with a bailer. If a bailer is used, the following requirements must be satisfied:

(i) The **ground water monitoring** well must be purged a minimum of three (3) well volumes if the ground water recharge rate is greater than the ground water withdrawal rate.

(B) Evacuation may be accomplished with a bailer. If a bailer is used, the following requirements must be satisfied:

- (i) The **ground water monitoring** well must be purged a minimum of three (3) well volumes if the ground water recharge rate is greater than the ground water withdrawal rate.
- (ii) The **ground water monitoring** well may be purged dry if the ground water recharge rate is less than the ground water withdrawal rate.
- (iii) Purging a **ground water monitoring** well more than five (5) well volumes is prohibited.
- (iv) The bailer must be made of Teflon®, PVC, stainless steel, or other material approved by the commissioner.
- (v) To assure that volatile organics are not stripped from the water, the bailer must be lowered in a slow and steady manner until the top of the ground water is contacted.
- (vi) The bailer must be lowered into the water column until the bailer is full or the base of the **ground water monitoring** well is contacted by the bottom of the bailer.
- (vii) Once full of water, the bailer must be lowered no further into the water column.
- (viii) The bailer cord must not touch or contact the water column.
- (ix) To assure that volatile organics are not stripped from the water, the bailer must be withdrawn at a slow steady rate up the **ground water monitoring** well casing.
- (x) When the bailer reaches the top of the **ground water monitoring** well riser, the bailer must be removed carefully to prevent aeration or agitation.
- (xi) The bailer cord must be pulled away from the water when pouring from a top discharging bailer.

(C) The MSWLF's sampling and analysis plan must designate methods for disposal of purged water and decontamination solutions.

(D) The commissioner shall consider a **ground water monitoring** well to be dry under the following circumstances:

(ii) The **ground water monitoring** well may be purged dry if the ground water recharge rate is less than the ground water withdrawal rate.

(iii) Purging a **ground water monitoring** well more than five (5) well volumes is prohibited.

(iv) The bailer must be made of Teflon®, PVC, stainless steel, or other material approved by the commissioner.

(v) To assure that volatile organics are not stripped from the water, the bailer must be lowered in a slow and steady manner until the top of the ground water is contacted.

(vi) The bailer must be lowered into the water column until the bailer is full or the base of the **ground water monitoring** well is contacted by the bottom of the bailer.

(vii) Once full of water, the bailer must be lowered no further into the water column.

(viii) The bailer cord must not touch or contact the water column.

(ix) To assure that volatile organics are not stripped from the water, the bailer must be withdrawn at a slow steady rate up the **ground water monitoring** well casing.

(x) When the bailer reaches the top of the **ground water monitoring** well riser, the bailer must be removed carefully to prevent aeration or agitation.

(xi) The bailer cord must be pulled away from the water when pouring from a top discharging bailer.

(C) The MSWLF's sampling and analysis plan must designate methods for disposal of purged water and decontamination solutions.

(D) The commissioner shall consider a **ground water monitoring** well to be dry under the following circumstances:

(i) The **ground water monitoring** well is not mechanically damaged, yet it is unable to deliver water when opened for sampling.

(ii) The **ground water monitoring** well does not have a recovery rate adequate to supply ground water for sampling within a twenty-four (24) hour period after the monitoring well is purged.

- (i) The **ground water monitoring** well is not mechanically damaged, yet it is unable to deliver water when opened for sampling.
 - (ii) The **ground water monitoring** well does not have a recovery rate adequate to supply ground water for sampling within a twenty-four (24) hour period after the monitoring well is purged.
- (E) A **ground water monitoring** well that is dry on a consistent basis may be deemed by the commissioner to be an improperly functioning **ground water monitoring** well. The owner, operator, or permittee may be required to replace or relocate any improperly functioning **ground water monitoring** well.
- (6) Upon request, the commissioner may approve use of equipment or methods not specified in subdivision (5). The alternative equipment must provide equivalent evacuation efficiency and the request must include:
 - (A) an exact description of the purging or sampling apparatus;
 - (B) operational specifics of the apparatus; and
 - (C) an explanation of why the proposed sampling equipment is equivalent or superior to the equipment specified under subdivision (5) for:
 - (i) accuracy of readings;
 - (ii) minimization of cross contamination;
 - (iii) suitability of the equipment to the site; and
 - (iv) ease of decontamination, when applicable.
- (7) Ground water monitoring sample collection for detection monitoring, verification resampling, assessment, and corrective action ground water monitoring programs must satisfy the following requirements:
 - (A) Each sample must be numbered and labeled as a separate sample.
 - (B) One (1) or more independent samples must be collected from every ground water monitoring well on-site or as otherwise specified by the commissioner.
 - (C) At least one (1) field duplicate sample must be collected as follows:
 - (i) A field duplicate sample is defined as an additional sample collected from a ground water monitoring well, where:
 - (AA) the additional sample is analyzed independently of the first sample obtained from that **ground water monitoring** well; and
 - (BB) the ground water quality results for the additional sample are not used in the statistical evaluation, unless approved by the commissioner.
 - (ii) The field duplicate sample must be treated in the same manner as the independent sample.
- (E) A **ground water monitoring** well that is dry on a consistent basis may be deemed by the commissioner to be an improperly functioning **ground water monitoring** well. The owner, operator, or permittee may be required to replace or relocate any improperly functioning **ground water monitoring** well.
- (6) Upon request, the commissioner may approve use of equipment or methods not specified in subdivision (5). The alternative equipment must provide equivalent evacuation efficiency and the request must include:
 - (A) an exact description of the purging or sampling apparatus;
 - (B) operational specifics of the apparatus; and
 - (C) an explanation of why the proposed sampling equipment is equivalent or superior to the equipment specified under subdivision (5) for:
 - (i) accuracy of readings;
 - (ii) minimization of cross contamination;
 - (iii) suitability of the equipment to the site; and
 - (iv) ease of decontamination, when applicable.
- (7) Ground water monitoring sample collection for detection monitoring, verification resampling, assessment, and corrective action ground water monitoring programs must satisfy the following requirements:
 - (A) Each sample must be numbered and labeled as a separate sample.
 - (B) One (1) or more independent samples must be collected from every ground water monitoring well on-site or as otherwise specified by the commissioner.
 - (C) At least one (1) field duplicate sample must be collected as follows:
 - (i) A field duplicate sample is defined as an additional sample collected from a ground water monitoring well, where:
 - (AA) the additional sample is analyzed independently of the first sample obtained from that **ground water monitoring** well; and
 - (BB) the ground water quality results for the additional sample are not used in the statistical evaluation, unless approved by the commissioner.
 - (ii) The field duplicate sample must be treated in the same manner as the independent sample.

a ground water monitoring well, where:

(AA) the additional sample is analyzed independently of the first sample obtained from that **ground water monitoring** well; and

(BB) the ground water quality results for the additional sample are not used in the statistical evaluation, unless approved by the commissioner.

(ii) The field duplicate sample must be treated in the same manner as the independent sample.

(iii) A field duplicate sample must be collected from one (1) **ground water monitoring** well for every ten (10) monitoring wells, or part thereof, sampled.

(iv) The field duplicate sample must not be identified as such to the laboratory performing the sample analysis.

(D) The first sample collected from a given **ground water monitoring** well must be listed on the field record as the independent sample. The additional sample from the given **monitoring** well must be listed on the field record as the field duplicate sample.

(E) The independent sample and the field duplicate sample must be collected consecutively. The equipment for obtaining the samples does not require decontamination between sample collection; however, the independent sample and the field duplicate sample must be analyzed independently of each other.

(F) At least one (1) trip blank sample must be taken and must meet the following requirements:

(i) Be containerized prior to entering the MSWLF.

(ii) Consist of water that is:

(AA) distilled;

(BB) deionized; or

(CC) laboratory grade water.

(iii) Be analyzed for all constituents required for the sampling event unless a justification for limiting the trip blank to specific constituents is submitted to and approved by the commissioner.

(iv) Accompany the independent samples at all times.

(iii) A field duplicate sample must be collected from one (1) **ground water monitoring** well for every ten (10) monitoring wells, or part thereof, sampled.

(iv) The field duplicate sample must not be identified as such to the laboratory performing the sample analysis.

(D) The first sample collected from a given **ground water monitoring** well must be listed on the field record as the independent sample.

The additional sample from the given **monitoring** well must be listed on the field record as the field duplicate sample.

(E) The independent sample and the field duplicate sample must be collected consecutively. The equipment for obtaining the samples does not require decontamination between sample collection; however, the independent sample and the field duplicate sample must be analyzed independently of each other.

(F) At least one (1) trip blank sample must be taken and must meet the following requirements:

(i) Be containerized prior to entering the MSWLF.

(ii) Consist of water that is:

(AA) distilled;

(BB) deionized; or

(CC) laboratory grade water.

(iii) Be analyzed for all constituents required for the sampling event unless a justification for limiting the trip blank to specific constituents is submitted to and approved by the commissioner.

(iv) Accompany the independent samples at all times.

(v) The trip blank must be identified as such to the laboratory performing the sample analysis.

(G) At least one (1) equipment blank sample must be collected from each piece of nondedicated equipment used to collect samples at the site, in accordance with the following:

(i) The water used for the equipment blank sample collection must be either distilled water or deionized water.

(ii) The equipment to be sampled must include:

(AA) all nondedicated pumps and bailers;

(v) The trip blank must be identified as such to the laboratory performing the sample analysis.

(G) At least one (1) equipment blank sample must be collected from each piece of nondedicated equipment used to collect samples at the site, in accordance with the following:

- (i) The water used for the equipment blank sample collection must be either distilled water or deionized water.
- (ii) The equipment to be sampled must include:
 - (AA) all nondedicated pumps and bailers;
 - (BB) intermediate containers;
 - (CC) probes used for measuring static water levels, if the probe is inserted into the **ground water monitoring** well after the well is purged; and
 - (DD) reusable sections of the field filtration equipment.

(iii) The equipment blank must be analyzed for all constituents required by the sampling event unless a justification for limiting the equipment blank to specific constituents is submitted to and approved by the commissioner.

(iv) The equipment blank must be obtained after the last **ground water** monitoring well has been sampled.

(v) The equipment blank must be identified as such to the laboratory performing the sample analysis.

(H) At the end of each sampling day, the sampler may collect at least one (1) field blank sample. If a field blank sample is collected, the following criteria must be met:

- (i) The water used for the sample must be distilled water or deionized water brought onto the site and poured into the designated sample bottles within fifty (50) feet from any ground water monitoring well sampled the day the field blank is collected.
- (ii) Field blank samples must be analyzed for all constituents required for the sampling event unless a justification for limiting the field blank to specific constituents is submitted to and approved by the commissioner.

(BB) intermediate containers;
(CC) probes used for measuring static water levels, if the probe is inserted into the **ground water monitoring** well after the well is purged; and

(DD) reusable sections of the field filtration equipment.

(iii) The equipment blank must be analyzed for all constituents required by the sampling event unless a justification for limiting the equipment blank to specific constituents is submitted to and approved by the commissioner.

(iv) The equipment blank must be obtained after the last **ground water** monitoring well has been sampled.

(v) The equipment blank must be identified as such to the laboratory performing the sample analysis.

(H) At the end of each sampling day, the sampler may collect at least one (1) field blank sample. If a field blank sample is collected, the following criteria must be met:

- (i) The water used for the sample must be distilled water or deionized water brought onto the site and poured into the designated sample bottles within fifty (50) feet from any ground water monitoring well sampled the day the field blank is collected.
- (ii) Field blank samples must be analyzed for all constituents required for the sampling event unless a justification for limiting the field blank to specific constituents is submitted to and approved by the commissioner.

(iii) The field blank must be identified as such to the laboratory performing the sample analysis.

(8) Ground water samples must be collected in a sequence that satisfies the following:

(A) **Ground water monitoring** wells must be sampled in a sequence that minimizes the potential for cross contamination of samples. Historical ground water quality data must be used in estimating a well's potential for contamination. Samples must be collected in order of increasing likelihood of contamination in the **monitoring** well supplying the sample as follows:

(iii) The field blank must be identified as such to the laboratory performing the sample analysis.

(8) Ground water samples must be collected in a sequence that satisfies the following:

(A) **Ground water monitoring** wells must be sampled in a sequence that minimizes the potential for cross contamination of samples. Historical ground water quality data must be used in estimating a well's potential for contamination. Samples must be collected in order of increasing likelihood of contamination in the **monitoring** well supplying the sample as follows:

(i) All **upgradient background** ground water monitoring wells must be sampled before downgradient wells.

(ii) If downgradient **ground water monitoring** wells have not been verified to be contaminated, samples must be collected first from those downgradient **monitoring** wells that are furthest from disposed solid waste, followed by **monitoring** wells that are increasingly close to disposed solid waste.

(iii) Downgradient **ground water monitoring** wells that have been verified as contaminated must be sampled in sequence, starting with those downgradient **monitoring** wells that have the lowest level of contaminants, followed by **monitoring** wells that have increasingly higher levels of contaminants.

(B) Samples must be collected in a sequence that minimizes volatilization of compounds. Samples must be collected in order of decreasing volatility as follows:

(i) For the constituents listed in section 15(a) of this rule (Table 1A) and section 15(b) of this rule (Table 1B):

(AA) volatile organic compounds;

(BB) field pH;

(CC) field specific conductance;

(DD) dissolved metals; and

(EE) all other constituents.

(ii) For the constituents listed in section 16 of this rule (Table 2):

(AA) volatile organic

compounds;

(BB) field pH;

(i) All **upgradient background** ground water monitoring wells must be sampled before downgradient wells.

(ii) If downgradient **ground water monitoring** wells have not been verified to be contaminated, samples must be collected first from those downgradient **monitoring** wells that are furthest from disposed solid waste, followed by **monitoring** wells that are increasingly close to disposed solid waste.

(iii) Downgradient **ground water monitoring** wells that have been verified as contaminated must be sampled in sequence, starting with those downgradient **monitoring** wells that have the lowest level of contaminants, followed by **monitoring** wells that have increasingly higher levels of contaminants.

(B) Samples must be collected in a sequence that minimizes volatilization of compounds. Samples must be collected in order of decreasing volatility as follows:

(i) For the constituents listed in section 15(a) of this rule (Table 1A) and section 15(b) of this rule (Table 1B):

(AA) volatile organic compounds;

(BB) field pH;

(CC) field specific conductance;

(DD) dissolved metals; and

(EE) all other constituents.

(ii) For the constituents listed in section 16 of this rule (Table 2):

(AA) volatile organic compounds;

(BB) field pH;

(CC) field specific conductance;

(DD) semivolatile organics;

(EE) dissolved metals;

(FF) total metals; and

(GG) all other constituents.

(C) A sample collection sequence for the constituents listed in section 15(a) of this rule (Table 1A), section 15(b) of this rule (Table 1B), and section 16 of this rule (Table 2) must be developed for use in the event that a ground water monitoring well cannot supply sufficient water volume to collect a full sample. To establish the sample collection sequence, the owner, operator, or permittee shall consider:

(i) **ground water monitoring** well logs; and

- (CC) field specific conductance;
- (DD) semivolatile organics;
- (EE) dissolved metals;
- (FF) total metals; and
- (GG) all other constituents.

(C) A sample collection sequence for the constituents listed in section 15(a) of this rule (Table 1A), section 15(b) of this rule (Table 1B), and section 16 of this rule (Table 2) must be developed for use in the event that a ground water monitoring well cannot supply sufficient water volume to collect a full sample. To establish the sample collection sequence, the owner, operator, or permittee shall consider:

- (i) **ground water monitoring** well logs; and
- (ii) previous sample data.

(9) All nondedicated equipment must be decontaminated in accordance with the following requirements:

(A) Decontamination procedures must be implemented after sample collection at each **ground water monitoring** well and before reuse of the equipment. Time of decontamination must be indicated on the field report sheet. The commissioner may approve alternate decontamination procedures that provide equally reliable prevention of cross contamination.

(B) If a rotary pump is used, then the following decontamination procedures must be implemented:

- (i) The interior, exterior, and tubing must be decontaminated.
- (ii) The exterior of the rotary pump must be washed with a nonphosphate detergent and potable water bath. The exterior of the rotary pump must be rinsed in potable water and double rinsed in deionized or distilled water.
- (iii) The pump must have a volume of a nonphosphate detergent water mixture pumped through the system equal to one-third (1/3) of the previous **ground water monitoring** well's purge volume or two (2) gallons, whichever is less, to remove all pumped water from the internal parts. This solution must be pumped through the pump head and then continued through the tubing until ejected from the system.
- (iv) A gross rinse of potable water must

- (ii) previous sample data.

(9) All nondedicated equipment must be decontaminated in accordance with the following requirements:

(A) Decontamination procedures must be implemented after sample collection at each **ground water monitoring** well and before reuse of the equipment. Time of decontamination must be indicated on the field report sheet. The commissioner may approve alternate decontamination procedures that provide equally reliable prevention of cross contamination.

(B) If a rotary pump is used, then the following decontamination procedures must be implemented:

- (i) The interior, exterior, and tubing must be decontaminated.
- (ii) The exterior of the rotary pump must be washed with a nonphosphate detergent and potable water bath. The exterior of the rotary pump must be rinsed in potable water and double rinsed in deionized or distilled water.
- (iii) The pump must have a volume of a nonphosphate detergent water mixture pumped through the system equal to one-third (1/3) of the previous **ground water monitoring** well's purge volume or two (2) gallons, whichever is less, to remove all pumped water from the internal parts. This solution must be pumped through the pump head and then continued through the tubing until ejected from the system.
- (iv) A gross rinse of potable water must follow the detergent mixture specified in item (iii). The rinse water volume must match the volume specified in item (iii).
- (v) If samples are acquired from the pump, a minimum of three (3) gallons of distilled or deionized water rinse must be pumped through the system prior to sampling the next **ground water monitoring** well.
- (vi) The commissioner may approve an alternative decontamination procedure provided the alternative procedure yields equally reliable prevention of cross contamination.

(C) If a peristaltic pump is used, then the following decontamination procedures must be implemented:

follow the detergent mixture specified in item (iii). The rinse water volume must match the volume specified in item (iii).

(v) If samples are acquired from the pump, a minimum of three (3) gallons of distilled or deionized water rinse must be pumped through the system prior to sampling the next **ground water monitoring** well.

(vi) The commissioner may approve an alternative decontamination procedure provided the alternative procedure yields equally reliable prevention of cross contamination.

(C) If a peristaltic pump is used, then the following decontamination procedures must be implemented:

(i) The tubing must be decontaminated.
(ii) After each water sample passes through the pump, a volume of distilled or deionized water and nonphosphate detergent solution equal to the sample volume must be immediately passed through the pump.

(iii) The detergent solution must be followed by a potable water rinse. The volume of the rinse must be three (3) times the detergent solution volume.

(D) If a bailer is used, then the following decontamination procedures must be implemented:

(i) Proper equipment must be utilized to decontaminate the internal, external, and valve components of the bailer.

(ii) Nondedicated bailers must be decontaminated on-site prior to obtaining samples from the next **ground water monitoring** well.

Decontamination must consist of, in the following order:

(AA) Washing the interior and exterior surfaces of the bailer with a nonphosphate detergent solution.

(BB) Rinsing with potable water.

(CC) Final double rinsing with distilled or deionized water.

(iii) Dedicated bailers that are either stored at a site away from the sampling point, or stored in the **ground water monitoring** well riser and above the

(i) The tubing must be decontaminated.

(ii) After each water sample passes through the pump, a volume of distilled or deionized water and nonphosphate detergent solution equal to the sample volume must be immediately passed through the pump.

(iii) The detergent solution must be followed by a potable water rinse. The volume of the rinse must be three (3) times the detergent solution volume.

(D) If a bailer is used, then the following decontamination procedures must be implemented:

(i) ~~Proper equipment must be utilized to decontaminate~~ The internal, external, and valve components of the bailer **must be decontaminated**.

(ii) Nondedicated bailers must be decontaminated on-site prior to obtaining samples from the next **ground water monitoring** well. Decontamination must consist of, in the following order:

(AA) Washing the interior and exterior surfaces of the bailer with a nonphosphate detergent solution.

(BB) Rinsing with potable water.

(CC) Final double rinsing with distilled or deionized water.

(iii) Dedicated bailers that are either stored at a site away from the sampling point, or stored in the **ground water monitoring** well riser and above the maximum ground water level must be double rinsed with distilled or deionized water prior to use. Bailers must not be stored below the ground water level in the **monitoring** well.

(iv) Teflon® coated wire and any water level probe must be:

(AA) submerged in a nonphosphate detergent bath;

(BB) abraded by a clean cloth as the wire is removed from the wash bath;

(CC) deposited into a gross rinse bath of potable water; and

(DD) lifted as a coil and placed in a final distilled or deionized water rinse.

(v) A rope attached to the bailer or lead wire must not be reused.

(E) Meters that measure for specific conductance, temperature, Eh, and pH must

maximum ground water level must be double rinsed with distilled or deionized water prior to use. Bailers must not be stored below the ground water level in the **monitoring** well.

(iv) Teflon® coated wire and any water level probe must be:

- (AA) submerged in a nonphosphate detergent bath;
- (BB) abraded by a clean cloth as the wire is removed from the wash bath;
- (CC) deposited into a gross rinse bath of potable water; and
- (DD) lifted as a coil and placed in a final distilled or deionized water rinse.

(v) A rope attached to the bailer or lead wire must not be reused.

(E) Meters that measure for specific conductance, temperature, Eh, and pH must be washed with a nonphosphate detergent solution and rinsed with a volume of deionized water equal to a minimum of four (4) times the volume used by the meter for effective readings, unless nonphosphate detergent will inhibit the meter's ability to function properly.

(10) **Ground water** monitoring well samples must be collected in containers that are specified in either the MSWLF's sampling and analysis plan or the quality assurance project plan described in subdivision (13). ~~The commissioner may establish guidance regarding the following:~~

- ~~(A) Recommended preservatives.~~
- ~~(B) Bottle material composition.~~
- ~~(C) Minimum sample volumes.~~
- ~~(D) Refrigeration after sample collection.~~
- ~~(E) The prevention of exposure to direct radiation.~~

(11) Field meters for pH, Eh, and specific conductance must be as follows:

- (A) have accuracy of readings that do not vary more from a standard value than the following:
 - (i) Three percent (3%) of the reading for a suitable standard for specific conductance.
 - (ii) Twenty-five (25) millivolts of the indicator solution for Eh.
 - (iii) One-tenth (0.1) standard unit of the calibration standard value for pH.
- (B) be calibrated at the beginning and end of

be washed with a nonphosphate detergent solution and rinsed with a volume of deionized water equal to a minimum of four (4) times the volume used by the meter for effective readings, ~~unless nonphosphate detergent will inhibit the meter's ability to function properly.~~ **If this procedure will inhibit the ability of the meter to function, the meter must be washed in accordance with the manufacturer's instructions.**

(10) **Ground water** monitoring well samples must be collected in containers that are specified in either the MSWLF's sampling and analysis plan or the quality assurance project plan described in subdivision (13). ~~The commissioner may establish guidance regarding the following:~~

- ~~(A) Recommended preservatives.~~
- ~~(B) Bottle material composition.~~
- ~~(C) Minimum sample volumes.~~
- ~~(D) Refrigeration after sample collection.~~
- ~~(E) The prevention of exposure to direct radiation.~~

(11) Field meters for pH, Eh, and specific conductance must be as follows:

- (A) have accuracy of readings that do not vary more from a standard value than the following:
 - (i) Three percent (3%) of the reading for a suitable standard for specific conductance.
 - (ii) Twenty-five (25) millivolts of the indicator solution for Eh.
 - (iii) One-tenth (0.1) standard unit of the calibration standard value for pH.
- (B) be calibrated at the beginning and end of each day of a sampling event, or more frequently if recommended by a manufacturer's specifications, in accordance with the following:
 - (i) The calibration solutions of high, low, and midrange values must be retained on-site during the sampling event for potential use at every sampling point.
 - (ii) Calibrations must be conducted as specified by the manufacturer of the equipment.

(12) The sampler shall submit to the commissioner a field report for every sampling event. The report must include the following information pertaining to each ground water monitoring well **and piezometer, when applicable:**

- (A) The time and date each **ground water monitoring** well was purged and sampled.

each day of a sampling event, or more frequently if recommended by a manufacturer's specifications, in accordance with the following:

- (i) The calibration solutions of high, low, and midrange values must be retained on-site during the sampling event for potential use at every sampling point.
- (ii) Calibrations must be conducted as specified by the manufacturer of the equipment.

(12) The sampler shall submit to the commissioner a field report for every sampling event. The report must include the following information pertaining to each ground water monitoring well **and piezometer, when applicable:**

- (A) The time and date each **ground water monitoring** well was purged and sampled.
- (B) The location of each **ground water monitoring** well that was sampled, including indicating the **monitoring** well as **upgradient background** or downgradient of the solid waste boundary.
- (C) The condition of **ground water monitoring** well heads **and piezometers** and monitoring well security devices.
- (D) The weather conditions during sample collection.
- (E) The condition of purged water with regard to odor and turbidity, and the condition of the collected sample.
- (F) The in situ temperature, in degrees Celsius, of the ground water as measured in line or immediately after removal of water from the **ground water monitoring** well.
- (G) The static water elevations referenced to mean sea level and measured to the nearest one-hundredth (0.01) foot.
- (H) The type of equipment used for purging and for collection of samples and, where applicable, the cord's chemical composition.
- (I) A copy of the chain of custody for the sample.
- (J) The location and elevation of the referenced measuring mark on the **ground water monitoring well and piezometer** casing used to measure the static water elevations.
- (K) The time equipment was decontaminated at each **ground water monitoring** well location.
- (L) The reaction of the ground water to the

(B) The location of each **ground water monitoring** well that was sampled, including indicating the **monitoring** well as **upgradient background** or downgradient of the solid waste boundary.

(C) The condition of **ground water monitoring** well heads **and piezometers** and monitoring well security devices.

(D) The weather conditions during sample collection.

(E) The condition of purged water with regard to odor and turbidity, and the condition of the collected sample.

(F) The in situ temperature, in degrees Celsius, of the ground water as measured in line or immediately after removal of water from the **ground water monitoring** well.

(G) The static water elevations referenced to mean sea level and measured to the nearest one-hundredth (0.01) foot.

(H) The type of equipment used for purging and for collection of samples and, where applicable, the cord's chemical composition.

(I) A copy of the chain of custody for the sample.

(J) The location and elevation of the referenced measuring mark on the **ground water monitoring well and piezometer** casing used to measure the static water elevations.

(K) The time equipment was decontaminated at each **ground water monitoring** well location.

(L) The reaction of the ground water to the preserving agent when the sample is containerized.

(M) Additional information as required by the commissioner **based on particular site or facility conditions.**

(13) The owner, operator, or permittee of an MSWLF shall develop a quality assurance project plan and submit the following items to the commissioner for approval:

(A) Documentation to verify that all laboratories performing ground water sample analysis intend to comply with the minimum standards set forth in the facility's quality assurance project plan.

(B) One (1) scientifically valid and accurate testing method approved by the commissioner for each constituent required for analysis under this rule.

preserving agent when the sample is containerized.

(M) Additional information as required by the commissioner.

(13) The owner, operator, or permittee of an MSWLF shall develop a quality assurance project plan and submit the following items to the commissioner for approval:

(A) Documentation to verify that all laboratories performing ground water sample analysis intend to comply with the minimum standards set forth in the facility's quality assurance project plan.

(B) One (1) scientifically valid and accurate testing method approved by the commissioner for each constituent required for analysis under this rule.

(14) Each owner, operator, or permittee of an MSWLF shall develop and utilize a chain of custody protocol to account for the possession and security of any sample from the time the sample is taken until the analytical results are received by the commissioner. The chain of custody protocol must conform with the following:

(A) The field chain of custody form must account for the sample from the time the sample is removed from the **ground water monitoring** well until the time the sample is delivered to the laboratory and the sample custodian of the analytical laboratory signs the field chain of custody form.

(B) The laboratory chain of custody form must account for the location and security of the sample from the sample's arrival at the analytical laboratory until the analysis of the sample is found to be acceptable under the quality assurance plan.

(C) Field and laboratory chain of custody forms must identify each sample with its unique identifying number and include the following information:

- (i) The number and types of containers holding the sample.
- (ii) The names of all persons having contact with the sample, including those persons collecting or transporting the sample.
- (iii) The time and dates of any transfers in possession of a sample.
- (iv) The condition of the sample at the time of its arrival at the laboratory, including the condition of the sample's seal and the temperature inside each

(14) Each owner, operator, or permittee of an MSWLF shall develop and utilize a chain of custody protocol to account for the possession and security of any sample from the time the sample is taken until the analytical results are received by the commissioner. The chain of custody protocol must conform with the following:

(A) The field chain of custody form must account for the sample from the time the sample is removed from the **ground water monitoring** well until the time the sample is delivered to the laboratory and the sample custodian of the analytical laboratory signs the field chain of custody form.

(B) The laboratory chain of custody form must account for the location and security of the sample from the sample's arrival at the analytical laboratory until the analysis of the sample is found to be acceptable under the quality assurance plan.

(C) Field and laboratory chain of custody forms must identify each sample with its unique identifying number and include the following information:

- (i) The number and types of containers holding the sample.
- (ii) The names of all persons having contact with the sample, including those persons collecting or transporting the sample.
- (iii) The time and dates of any transfers in possession of a sample.
- (iv) The condition of the sample at the time of its arrival at the laboratory, including the condition of the sample's seal and the temperature inside each cooler holding a sample.

(D) In addition to the information required under clause (C), the field chain of custody form must include a task sheet that delineates the analysis to be performed on the sample or samples.

(E) The laboratory must maintain the laboratory chain of custody form and, upon request, release the laboratory chain of custody form to the commissioner. The field chain of custody form must be submitted to the commissioner in accordance with section 1~~(b)~~ (s) of this rule.

(c) Upon request, the commissioner may approve the use of methods, procedures, or equipment not specified in subsection (b). The alternative methods, procedures,

cooler holding a sample.

(D) In addition to the information required under clause (C), the field chain of custody form must include a task sheet that delineates the analysis to be performed on the sample or samples.

(E) The laboratory must maintain the laboratory chain of custody form and, upon request, release the laboratory chain of custody form to the commissioner. The field chain of custody form must be submitted to the commissioner in accordance with section 1(t) of this rule.

(c) Upon request, the commissioner may approve the use of methods, procedures, or equipment not specified in subsection (b). The alternative methods, procedures, or equipment must provide results or measurements that are equivalent in accuracy and reliability and the request must include the following:

- (1) an exact description of the alternative methods, procedures, or equipment; and
- (2) an explanation of why the proposed methods, procedures, or equipment are equivalent or superior to those specified under subsection (b).

329 IAC 10-21-4 Ground water monitoring well and piezometer construction and design

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 4. (a) Ground water monitoring wells **and piezometers** installed after the effective date of this article must comply with the requirements of this section.

(b) The following drilling techniques must be used to ensure proper ground water monitoring well construction:

(1) The method of drilling a borehole for a **ground water** monitoring well or for exploration must be selected to ensure the following:

- (A) Subsurface materials are not adversely affected.
- (B) Ground water or aquifers are not contaminated or cross-contaminated.
- (C) Quality continuous unconsolidated and consolidated material samples are collected.
- (D) Equipment sensitivity allows adequate determination of an appropriate screen location.
- (E) The diameter of the borehole is at least four (4) inches larger than the diameter of

or equipment must provide results or measurements that are equivalent in accuracy and reliability and the request must include the following:

- (1) an exact description of the alternative methods, procedures, or equipment; and
- (2) an explanation of why the proposed methods, procedures, or equipment are equivalent or superior to those specified under subsection (b).

329 IAC 10-21-4 Ground water monitoring well and piezometer construction and design

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 4. (a) Ground water monitoring wells **and piezometers** installed after ~~the effective date of this article~~ **April 13, 1996** must comply with the requirements of this section.

(b) The following drilling techniques must be used to ensure proper ground water monitoring well construction:

(1) The method of drilling a borehole for a **ground water** monitoring well or for exploration must be selected to ensure the following:

- (A) Subsurface materials are not adversely affected.
- (B) Ground water or aquifers are not contaminated or cross-contaminated.
- (C) Quality continuous unconsolidated and consolidated material samples are collected.
- (D) Equipment sensitivity allows adequate determination of an appropriate screen location.
- (E) The diameter of the borehole is at least four (4) inches larger than the diameter of the **ground**

the **ground water monitoring** well casing and screen, to allow tremie placement of the filter pack and annular sealants.

(F) Drill fluids other than water ~~fluid additives, or lubricants~~ are to be avoided.

However, if ~~they~~ **fluid additives or lubricants** are unavoidable, those used must be demonstrated to be inert and an impact statement must be made regarding the potential impact of any liquids introduced into the borehole concerning the physical and chemical characteristics of the subsurface and ground water.

(2) All equipment that will encounter formation materials must be decontaminated prior to drilling each new borehole.

(c) Casing and screen materials must comply with the following:

(1) Casing and screen materials must be chosen to:

- (A) be resistant to corrosion and degradation in any natural or contaminated environment;
- (B) be resistant to physical damage as a result of installation, usage, and time; and
- (C) have minimal effect on ground water chemistry with respect to the analytes of concern.

(2) The casing sections must be physically joined and made watertight by:

- (A) heat welding;
- (B) threading; or
- (C) force fitting.

(3) The use of solvents, glues, or other adhesives to join casing sections is prohibited.

(4) **For:**

(A) ground water monitoring wells, the casing must be two (2) inches in diameter or greater; **or**

(B) piezometers not to be used for sample collection the diameter must be one (1) inch or greater.

(5) Except for open borehole bedrock **ground water monitoring** wells, screens are required for all ground water monitoring wells **and piezometers** and must include the following:

- (A) The screens must be continuous slot wire or machine slotted.
- (B) Slot size must retain ninety percent (90%) to one hundred percent (100%) of the filter pack material.
- (C) Screen lengths must be not less than two (2) feet and not greater than ten (10) feet unless approved by the commissioner.

water monitoring well casing and screen, to allow tremie placement of the filter pack and annular sealants.

(F) Drill fluids other than water ~~fluid additives, or lubricants~~ are to be avoided

when possible. However, if ~~they~~ **fluid additives or lubricants** are unavoidable, those used must be demonstrated to be inert and an impact statement must be made regarding the potential impact of any liquids introduced into the borehole ~~concerning on~~ the physical and chemical characteristics of the subsurface and ground water.

(2) All equipment that will encounter formation materials must be decontaminated prior to drilling each new borehole.

(c) Casing and screen materials must comply with the following:

(1) Casing and screen materials must be chosen to:

- (A) be resistant to corrosion and degradation in any natural or contaminated environment;
- (B) be resistant to physical damage as a result of installation, usage, and time; and
- (C) have minimal effect on ground water chemistry with respect to the analytes of concern.

(2) The casing sections must be physically joined and made watertight by:

- (A) heat welding;
- (B) threading; or
- (C) force fitting.

(3) The use of solvents, glues, or other adhesives to join casing sections is prohibited.

(4) **For:**

(A) ground water monitoring wells, the casing must be two (2) inches in diameter or greater; **or**

(B) piezometers not to be used for sample collection, the diameter must be one (1) inch or greater.

(5) Except for open borehole bedrock **ground water monitoring** wells, screens are required for all ground water monitoring wells **and piezometers** and must include the following:

- (A) The screens must be continuous slot wire or machine slotted.
- (B) Slot size must retain ninety percent (90%) to one hundred percent (100%) of the filter pack material.
- (C) Screen lengths must be not less than two (2) feet and not greater than ten (10) feet

(6) **Ground water monitoring well and piezometer** casing and screens must be cleaned prior to introduction into the borehole to prevent manufacturers' residues and coatings from contaminating the borehole or aquifer.

(7) Screen and casing must be properly centered in the borehole prior to filling the annulus.

(d) Procedures for collecting, analyzing, and storing core samples must comply with the following:

(1) Continuous downhole samples of the unconsolidated and consolidated materials must be collected in all ground water monitoring well **and piezometer** boreholes **unless the ground water monitoring wells or piezometers are replacement monitoring wells or piezometers under section 1(g)(2) of this rule**. For monitoring well clusters **or piezometer clusters**, continuous samples must be collected from the surface to the base of the deepest **monitoring well or piezometer**; other **monitoring wells or piezometers** within the cluster must be sampled at all significant stratigraphic changes and at the screened interval. Samples must not be combined into composite samples for classification or testing.

(2) All procedures regarding testing and sampling must be described to the commissioner in writing.

(3) The owner, operator, or permittee shall:

(A) retain all borehole samples in labeled containers or labeled core boxes that are securely stored and accessible for a period of:

- (i) seven (7) years after the samples are collected; or
- (ii) seven (7) years after permit issuance;

whichever occurs later;

(B) notify the commissioner, in writing, of the location of the core sample storage; and

(C) ensure that core samples are available for inspection, by the commissioner or by a representative of the department, at all reasonable times or during normal operating hours.

(4) Each significant stratum encountered in the borehole must have the following analysis performed and testing results must be identified with respect to sample elevations and borehole:

(A) Complete grain size using the following techniques:

- (i) Sieve.
- (ii) Hydrometer.

unless approved by the commissioner **based on site-specific conditions**.

(6) **Ground water monitoring well and piezometer** casing and screens must be cleaned prior to introduction into the borehole to prevent manufacturers' residues and coatings from contaminating the borehole or aquifer.

(7) Screen and casing must be properly centered in the borehole prior to filling the annulus.

(d) Procedures for collecting, analyzing, and storing core samples must comply with the following:

(1) Continuous downhole samples of the unconsolidated and consolidated materials must be collected in all ground water monitoring well **and piezometer** boreholes **unless the ground water monitoring wells or piezometers are replacement monitoring wells or piezometers under section 1(g)(2)(B)**. For monitoring well clusters **or piezometer clusters**, continuous samples must be collected from the surface to the base of the deepest **monitoring well or piezometer**; other **monitoring wells or piezometers** within the cluster must be sampled at all significant stratigraphic changes and at the screened interval. Samples must not be combined into composite samples for classification or testing.

(2) All procedures regarding testing and sampling must be described to the commissioner in writing.

(3) The owner, operator, or permittee shall:

(A) retain all borehole samples in labeled containers or labeled core boxes that are securely stored and accessible for a period of:

- (i) seven (7) years after the samples are collected; or
- (ii) seven (7) years after permit issuance; whichever occurs later;

(B) notify the commissioner, in writing, of the location of the core sample storage; and

(C) ensure that core samples are available for inspection, by the commissioner or by a representative of the department, at all reasonable times or during normal operating hours.

(4) Each significant stratum encountered in the borehole must have the following analysis performed and testing results must be identified with respect to sample elevations and borehole:

(A) Complete grain size using the following techniques:

- (i) Sieve.
- (ii) Hydrometer.

(B) Cation exchange capacity.

- (B) Cation exchange capacity.
- (C) Hydraulic conductivity if the information for that strata is not available to the satisfaction of the commissioner.
- (D) Atterberg limits.

(e) The ground water monitoring well **or piezometer** annulus must be filled as follows when drilling is complete:

- (1) The annular space from six (6) inches below the well screen to two (2) feet above the well screen must be filled with a filter pack consisting of inert sand or gravel and shall comply with the following:
 - (A) A uniform grain size must be chosen to reflect three (3) to five (5) times the average fifty percent (50%) retained size of the formation material unless this filter pack grain size would impede adequate flow of ground water into the **ground water monitoring well or piezometer**. Should this happen, a filter pack grain size shall be used that allows ground water flow into the **monitoring well or piezometer** and prevents as much silt infiltration as possible.
 - (B) Natural material may be an acceptable constituent of the filter pack if slump is unavoidable.
 - (C) The filter pack in a bedrock **monitoring well or piezometer** is optional. However, if used, the filter pack must be of a nonreactive coarse sand or gravel.
 - (D) The upper one (1) to two (2) feet of the filter pack must be of fine, inert sand to prevent infiltration of seal materials.
 - (E) The filter pack must be emplaced without bridging, preferably by tremie pipe, or other methods as approved by the commissioner **to ensure the integrity of the filter pack**.
- (2) A bentonite seal of at least three (3) feet must be emplaced by tremie pipe in the annular space directly above the filter pack.
- (3) The annular space from the bentonite seal to one (1) foot below the frost line must be tremied with a grout of bentonite, cement/bentonite, or other shrinkage-compensated, low permeability fill and shall include the following:
 - (A) All bentonite and cements must be mixed to the manufacturer's specifications.
 - (B) Full hydration, curing, or setting of the bentonite seal must occur prior to further backfilling as required by this subdivision.
- (4) A surface seal of neat cement or concrete must

- (C) Hydraulic conductivity if the information **in this subsection** for that strata is not available to the satisfaction of the commissioner.
- ~~(D) Atterberg limits.~~

(e) The ground water monitoring well **or piezometer** annulus must be filled as follows when drilling is complete:

- (1) The annular space from six (6) inches below the well screen to two (2) feet above the well screen must be filled with a filter pack consisting of inert sand or gravel and shall comply with the following:
 - (A) A uniform grain size must be chosen to reflect three (3) to five (5) times the average fifty percent (50%) retained size of the formation material unless this filter pack grain size would impede adequate flow of ground water into the **ground water monitoring well or piezometer**. Should this happen, a filter pack grain size shall be used that allows ground water flow into the **monitoring well or piezometer** and prevents as much silt infiltration as possible.
 - (B) Natural material may be an acceptable constituent of the filter pack if slump is unavoidable.
 - (C) The filter pack in a bedrock **monitoring well or piezometer** is optional. However, if used, the filter pack must be of a nonreactive coarse sand or gravel.
 - (D) The upper one (1) to two (2) feet of the filter pack must be of fine, inert sand to prevent infiltration of seal materials.
 - (E) The filter pack must be emplaced without bridging, preferably by tremie pipe, or other methods as approved by the commissioner **to ensure the integrity of the filter pack**.
- (2) A bentonite seal of at least three (3) feet must be emplaced by tremie pipe in the annular space directly above the filter pack.
- (3) The annular space from the bentonite seal to one (1) foot below the frost line must be tremied with a grout of bentonite, cement/bentonite, or other shrinkage-compensated, low permeability fill and shall include the following:
 - (A) All bentonite and cements must be mixed to the manufacturer's specifications.
 - (B) Full hydration, curing, or setting of the bentonite seal must occur prior to further backfilling as required by this subdivision.
- (4) A surface seal of neat cement or concrete must be installed in the remaining borehole annular space above the intermediate fill, including the following:

be installed in the remaining borehole annular space above the intermediate fill, including the following:

- (A) The apron of the surface seal must be designed to prevent ponding and infiltration by extending at least two and five-tenths (2.5) feet from the **ground water monitoring** well casing.
- (B) The apron must slope at least fifteen (15) degrees outward.
- (C) A locking protective metal casing must be installed around the **ground water monitoring** well casing and be anchored below the frost line in the surface seal.
- (D) A vent hole or vented cap must be placed at the top of the **ground water monitoring well or piezometer** casing to allow accurate piezometric variation and to prevent gas build-up.
- (E) The annular space between the **ground water monitoring** well casing and the protective metal casing must be neat cement filled to a level at least one (1) inch higher than that of the surrounding apron.
- (F) A drainage hole must be drilled in the protective metal casing immediately above the cement fill specified in clause (E).
- (G) The remaining annular space between the **ground water monitoring** well casing and the protective metal casing must be filled with a fine gravel.
- (H) A weather resistant lock must be dedicated to the ~~unit~~ **ground water monitoring well** and must be serviced twice a year and when the **ground water monitoring well** is sampled.
- (I) A permanent unique identification must be affixed to each ground water monitoring well and the identification must be visible.
- (J) Three (3) foot bumper guards or other suitable protection may be required by the commissioner to prevent vehicular traffic from damaging the protective metal casing.

(f) The permittee shall provide ten (10) days' advance notification of the date and time of the installation of the monitoring wells **or piezometers**.

(g) Development of ground water monitoring wells must occur as soon as possible after the seal and grout have set and must conform with the following:

- (1) All **ground water** monitoring wells must be developed in such a way as to:

- (A) The apron of the surface seal must be designed to prevent ponding and infiltration by extending at least two and five-tenths (2.5) feet from the **ground water monitoring** well casing.
- (B) The apron must slope at least fifteen (15) degrees outward.
- (C) A locking protective metal casing must be installed around the **ground water monitoring** well casing and be anchored below the frost line in the surface seal.
- (D) A vent hole or vented cap must be placed at the top of the **ground water monitoring well or piezometer** casing to allow accurate piezometric variation and to prevent gas build-up.
- (E) The annular space between the **ground water monitoring** well casing and the protective metal casing must be neat cement filled to a level at least one (1) inch higher than that of the surrounding apron.
- (F) A drainage hole must be drilled in the protective metal casing immediately above the cement fill specified in clause (E).
- (G) The remaining annular space between the **ground water monitoring** well casing and the protective metal casing must be filled with a fine gravel.
- (H) A weather resistant lock must be dedicated to the ~~unit~~ **ground water monitoring well** and must be serviced twice a year and when the **ground water monitoring well** is sampled.
- (I) A permanent unique identification must be affixed to each ground water monitoring well and the identification must be visible.
- (J) Three (3) foot bumper guards or other suitable protection may be required by the commissioner to prevent vehicular traffic from damaging the protective metal casing.

(f) The permittee shall provide ten (10) days' advance notification **to the department** of the date and time of the installation of the monitoring wells **or piezometers**.

(g) Development of ground water monitoring wells must occur as soon as possible after the seal and grout have set and must conform with the following:

- (1) All **ground water** monitoring wells must be developed in such a way as to:
 - (A) allow free entry of formation water;
 - (B) minimize turbidity of the sample; and

- (A) allow free entry of formation water;
 - (B) minimize turbidity of the sample; and
 - (C) minimize clogging of the **monitoring** wells.
- (2) Development methods chosen must be appropriate for the stratigraphic conditions.
- (3) An in situ hydraulic conductivity test must be performed after the **ground water monitoring** well has been properly developed.
- (h) Diagrammatical borehole drilling logs for all ground water monitoring wells **and piezometers** must be of similar scale and include the following information:
- (1) The monitoring well **or piezometer** and borehole identification.
 - (2) The date of drilling.
 - (3) The method of drilling.
 - (4) The borehole diameter.
 - (5) The method of obtaining consolidated material and unconsolidated material.
 - (6) The type of any drill fluids, fluid additives, or lubricants other than water that have been used.
 - (7) Penetration measurements, such as hammer blow counts, penetrometer measurements, or other acceptable penetration measurements.
 - (8) The sample recovery measured to the nearest one-tenth (0.1) foot.
 - (9) Consolidated material and unconsolidated material field descriptions, including the following information:
 - (A) Lithology and sedimentology.
 - (B) Mineralogy.
 - (C) Degree of cementation.
 - (D) Degree of moisture.
 - (E) Color as referenced from soil color charts such as the Munsell soil charts.
 - (F) Grain size and textural classification of unconsolidated samples as referenced from the United States Department of Agriculture (**USDA**) textural classification charts. Grain-size divisions shall be based on a modified form of the Wentworth grain-size scale defined under 329 IAC 10-2-206.3. A determination shall be made of the percentage and grades of coarse fragments greater than two (2) millimeters in size based on 329 IAC 10-2-206.3 in addition to the USDA textural classification. Consolidated samples must be described using accepted geological classification systems and nomenclature. A clear description of the classification system used must be included

- (C) minimize clogging of the **monitoring** wells.
- (2) Development methods chosen must be appropriate for the stratigraphic conditions.
- (3) An in situ hydraulic conductivity test must be performed after the **ground water monitoring** well has been properly developed.
- (h) Diagrammatical borehole drilling logs for all ground water monitoring wells **and piezometers** must be of similar scale and include the following information:
- (1) The monitoring well **or piezometer** and borehole identification.
 - (2) The date of drilling.
 - (3) The method of drilling.
 - (4) The borehole diameter.
 - (5) The method of obtaining consolidated material and unconsolidated material.
 - (6) The type of any drill fluids, fluid additives, or lubricants other than water that have been used.
 - (7) Penetration measurements, such as hammer blow counts, penetrometer measurements, or other acceptable penetration measurements.
 - (8) The sample recovery measured to the nearest one-tenth (0.1) foot.
 - (9) Consolidated material and unconsolidated material field descriptions, including the following information:
 - (A) Lithology and sedimentology.
 - (B) Mineralogy.
 - (C) Degree of cementation.
 - (D) Degree of moisture.
 - (E) Color as referenced from soil color charts such as the Munsell soil charts.
 - (F) Grain size and textural classification of unconsolidated samples as referenced from the United States Department of Agriculture (**USDA**) textural classification charts. Grain-size divisions shall be based on a modified form of the Wentworth grain-size scale defined under 329 IAC 10-2-206.3. A determination shall be made of the percentage and grades of coarse fragments greater than two (2) millimeters in size based on 329 IAC 10-2-206.3 in addition to the USDA textural classification. Consolidated samples must be described using accepted geological classification systems and nomenclature. A clear description of the classification system used must be included with the logs.
 - (G) Any other physical characteristics of the consolidated material and unconsolidated

with the logs.

(G) Any other physical characteristics of the consolidated material and unconsolidated material such as scent, staining, fracturing, and solution features.

(H) The percent recovery and rock quality designation.

(I) Other primary or secondary features.

(J) Drilling observations and appropriate details required for unconsolidated drilling logs.

(K) A clear photograph of all consolidated cores, labeled with:

- (i) the date the photograph was taken;
- (ii) the sample interval;
- (iii) the reference scale;
- (iv) the reference color scale; and
- (v) the identification of the borehole.

(L) Interval of continuous samples and unconsolidated material test data.

(10) Distance to and depth of any water bearing zones, measured to the nearest one-hundredth (0.01) foot.

(11) Static water elevations measured to the nearest one-hundredth (0.01) foot and indicating the dates and times the measurements were taken.

(12) The elevation of permanent **monitoring wells or piezometers** at the ground surface to the nearest one-tenth (0.1) foot, with the referenced measuring mark measured to the nearest one-hundredth (0.01) foot relative to the National Geodetic Vertical Datum.

(13) The horizontal location of permanent **monitoring wells or piezometers** measured to the nearest thirty (30) cm using Universal Transverse Mercator (UTM) coordinates.

(14) Total borehole depth and elevation measured to the nearest one-hundredth (0.01) foot.

(15) Elevation range of screened interval measured to the nearest one-hundredth (0.01) foot.

(i) ~~Diagrammatic~~ **The construction details and design logs diagrams** of all pertinent ground water monitoring wells must **be recorded on logs and** include the following information:

(1) The monitoring well identification and UTM coordinates as described under subsection (h)(13).

(2) The composition of **monitoring** well and protective casing materials.

(3) The type of joints and couplings between **monitoring** well casing segments.

(4) The elevations of the ground ~~water~~ surface to the nearest one-tenth (0.1) foot and of the

material such as scent, staining, fracturing, and solution features.

(H) The percent recovery and rock quality designation.

(I) Other primary or secondary features.

(J) Drilling observations and appropriate details required for unconsolidated drilling logs.

(K) A clear photograph of all consolidated cores, labelled with:

- (i) the date the photograph was taken;
- (ii) the sample interval;
- (iii) the reference scale;
- (iv) the reference color scale; and
- (v) the identification of the borehole.

(L) Interval of continuous samples and unconsolidated material test data.

(10) Distance to and depth of any water bearing zones, measured to the nearest one-hundredth (0.01) foot.

(11) Static water elevations measured to the nearest one-hundredth (0.01) foot and indicating the dates and times the measurements were taken.

(12) The elevation of permanent **monitoring wells or piezometers** at the ground surface to the nearest one-tenth (0.1) foot, with the referenced measuring mark measured to the nearest one-hundredth (0.01) foot relative to the National Geodetic Vertical Datum.

(13) The horizontal location of permanent monitoring wells **or piezometers** measured to the nearest thirty (30) cm using Universal Transverse Mercator (UTM) coordinates.

(14) Total borehole depth and elevation measured to the nearest one-hundredth (0.01) foot.

(15) Elevation range of screened interval measured to the nearest one-hundredth (0.01) foot.

(i) ~~Diagrammatic~~ **The construction details and design logs diagrams** of all pertinent ground water monitoring wells must **be recorded on logs and** include the following information:

(1) The monitoring well identification and UTM coordinates as described under subsection (h)(13).

(2) The composition of **monitoring** well and protective casing materials.

(3) The type of joints and couplings between **monitoring** well casing segments.

(4) The elevations of the ground ~~water~~ surface to the nearest one-tenth (0.1) foot and of the referenced measuring mark at the top of the **monitoring** well casing measured to the nearest one-hundredth (0.01)

referenced measuring mark at the top of the **monitoring** well casing measured to the nearest one-hundredth (0.01) foot relative to the National Geodetic Vertical Datum.

- (5) The diameter of **monitoring** well casing and borehole.
- (6) The elevation of the bottom of the borehole and the depth of the borehole measured to the nearest one-hundredth (0.01) foot.
- (7) The screen slot size.
- (8) The elevation range of the screened interval measured to the nearest one-hundredth (0.01) foot.
- (9) The screen length measured to the nearest one-hundredth (0.01) foot.
- (10) Methods of installation of the annular fill.
- (11) The elevation range and the depth of the filter pack measured to the nearest one-hundredth (0.01) foot.
- (12) The length of the filter pack.
- (13) The grain size and composition of all filter pack materials and the fifty percent (50%) retained size of the formation material used to determine filter pack materials.
- (14) The elevation and depth range of the bentonite seal above the filter pack measured to the nearest one-hundredth (0.01) foot.
- (15) The thickness of the bentonite seal above the filter pack.
- (16) The composition of annular fill.
- (17) The elevation range, depth range, and thickness of annular fill measured to the nearest one-hundredth (0.01) foot.
- (18) The composition and design of the surface seal.
- (19) The design and composition of materials used for the protection of the **monitoring** well casing.

(j) The construction details and diagrams of each piezometer must be recorded on the logs and include the following:

- (1) Piezometer identification number and UTM coordinates.
- (2) Elevation of the top of the piezometer casing.
- (3) Height of piezometer casing above the ground.
- (4) Elevation of the ground surface.
- (5) Elevation and depth to the bottom of the borehole.
- (6) Diameter of piezometer casing and borehole.
- (7) Elevation and depth to the bottom and top of the piezometer screen.

foot relative to the National Geodetic Vertical Datum.

- (5) The diameter of **monitoring** well casing and borehole.
- (6) The elevation of the bottom of the borehole and the depth of the borehole measured to the nearest one-hundredth (0.01) foot.
- (7) The screen slot size.
- (8) The elevation range of the screened interval measured to the nearest one-hundredth (0.01) foot.
- (9) The screen length measured to the nearest one-hundredth (0.01) foot.
- (10) Methods of installation of the annular fill.
- (11) The elevation range and the depth of the filter pack measured to the nearest one-hundredth (0.01) foot.
- (12) The length of the filter pack.
- (13) The grain size and composition of all filter pack materials and the fifty percent (50%) retained size of the formation material, **when** used to determine **the grain size of the** filter pack materials.
- (14) The elevation and depth range of the bentonite seal above the filter pack measured to the nearest one-hundredth (0.01) foot.
- (15) The thickness of the bentonite seal above the filter pack.
- (16) The composition of annular fill.
- (17) The elevation range, depth range, and thickness of annular fill measured to the nearest one-hundredth (0.01) foot.
- (18) The composition and design of the surface seal.
- (19) The design and composition of materials used for the protection of the **monitoring** well casing.

(j) The construction details and diagram of each piezometer must be recorded on logs and include the following:

- (1) Piezometer identification number and UTM coordinates.
- (2) Elevation of the top of the piezometer casing.
- (3) Height of piezometer casing above the ground.
- (4) Elevation of the ground surface.
- (5) Elevation and depth to the bottom of the borehole.
- (6) Diameter of piezometer casing and borehole.
- (7) Elevation and depth to the bottom and top of the piezometer screen.
- (8) Length of piezometer casing.
- (9) Composition of piezometer casing materials and piezometer screen material.
- (10) Length of piezometer screen.
- (11) Screen slot size.

- (8) Length of piezometer casing.
- (9) Composition of piezometer casing materials and piezometer screen material.
- (10) Length of piezometer screen.
- (11) Screen slot size.
- (12) Type of joints or couplings, or both, between casing segments.
- (13) Elevation and depth to the top and bottom of the gravel filter pack surrounding the piezometer screen.
- (14) Length of the gravel filter pack.
- (15) Elevation and depth of the bottom of the piezometer casing.
- (16) Elevation and depth of the top and bottom of the seal above the gravel filter pack.
- (17) The grain size and composition of all filter pack materials and the fifty percent (50%) retained size of the formation material used to determine filter pack materials.
- (18) Thickness of the seal above the gravel filter pack.
- (19) Elevation and depth of the annular seal above the gravel filter pack seal.
- (20) Thickness of the annular seal.
- (21) Material used for the annular seal.
- (22) Method of installation of the annular seal.
- (23) The composition and design of the surface seal.

329 IAC 10-21-6 Statistical evaluation requirements and procedures

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 6. (a) The owner, operator, or permittee shall determine if there is a statistically significant increase for each constituent analyzed, except for constituents listed in section 15(b) of this rule (Table 1B). This statistical evaluation is required each time ground water is collected and analyzed at the monitoring boundary for all MSWLFs.

(b) To determine a statistically significant increase compared to the background ground water quality, each constituent from each ground water monitoring well sample must be compared to the background ground water quality of that constituent, according to the statistical procedures and performance standards specified in this section.

(c) The owner, operator, or permittee shall submit to the commissioner for approval a written statistical evaluation plan for each ground water monitoring program required under this rule. Submittal of the plan

- (12) Type of joints or couplings, or both, between casing segments.
- (13) Elevation and depth to the top and bottom of the gravel filter pack surrounding the piezometer screen.
- (14) Length of the gravel filter pack.
- (15) Elevation and depth of the bottom of the piezometer casing.
- (16) Elevation and depth of the top and bottom of the seal above the gravel filter pack.
- (17) The grain size and composition of all filter pack materials and the fifty percent (50%) retained size of the formation material, when used to determine the grain size of the filter pack materials.
- (18) Thickness of the seal above the gravel filter pack.
- (19) Elevation and depth of the annular seal above the gravel filter pack seal.
- (20) Thickness of the annular seal.
- (21) Material used for the annular seal.
- (22) Method of installation of the annular seal.
- (23) The composition and design of the surface seal.

329 IAC 10-21-6 Statistical evaluation requirements and procedures

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 6. (a) The owner, operator, or permittee shall determine if there is a statistically significant increase for each constituent analyzed, except for constituents listed in section 15(b) of this rule (Table 1B). This statistical evaluation is required each time ground water is collected and analyzed at the monitoring boundary for all MSWLFs.

(b) To determine a statistically significant increase compared to the background ground water quality, each constituent from each ground water monitoring well sample must be compared to the background ground water quality of that constituent, according to the statistical procedures and performance standards specified in this section.

(c) The owner, operator, or permittee shall submit to the commissioner for approval a written statistical evaluation plan for each ground water monitoring

must comply with the following:

- (1) For all new MSWLFs and lateral expansions to be permitted under this article, the plan must be submitted before the first sampling event occurs following permit issuance or as otherwise specified by the commissioner.
- (2) For existing MSWLFs, the plan must be submitted with the next renewal application, at the time of closure, or as specified by the commissioner, whichever occurs first, unless a statistical evaluation plan that includes all applicable requirements under this section has been previously submitted.
- (3) The plan must explain which of the various statistical methods, described in subsection (f), may be needed to address a continuously expanding ground water data base. All statistical methods must meet the performance standards outlined in subsection (g).
- (4) The plan must identify the statistical procedures to be used whenever verification resampling, as specified under section 8 of this rule, is implemented.
- (5) The plan must identify any computer data management or statistical evaluation program used by the owner, operator, or permittee and, upon request by the commissioner, include appropriate documentation of the computer program.

(d) Changes to the statistical evaluation plan must not be implemented without approval from the commissioner.

(e) The owner, operator, or permittee shall submit a statistical evaluation report of the ground water sample analysis to the commissioner. The report must be submitted within sixty (60) days after obtaining ground water samples from the ground water monitoring wells, unless a verification resampling program described under section 8 of this rule, is implemented. The statistical evaluation report must include the following:

- (1) All input data, output data, and equations used for all calculations and statistical tests utilized.
- (2) A detailed discussion of the conclusions from the statistical evaluation. This discussion must include the identification of all constituents found to have a statistically significant increase.
- (3) A graphical representation of the MSWLF's ground water data when requested by the commissioner. The commissioner shall provide guidance in preparing graphics.

(f) Any of the following statistical procedures may

program required under this rule. Submittal of the plan must comply with the following:

- (1) For all new MSWLFs and lateral expansions to be permitted under this article, the **statistical evaluation plan shall be developed in accordance with the general description submitted under 329 IAC 10-15-1(a)(12)** ~~must be submitted before the first sampling event occurs following permit issuance or as otherwise specified by the commissioner.~~

(2) For existing MSWLFs, the plan must be submitted with the next renewal application, at the time of closure, or as specified by the commissioner, whichever occurs first, unless a statistical evaluation plan that includes all applicable requirements under this section has been previously submitted.

(3) The plan must explain which of the various statistical methods, described in subsection (f), may be needed to address a continuously expanding ground water data base. All statistical methods must meet the performance standards outlined in subsection (g).

(4) The plan must identify the statistical procedures to be used whenever verification resampling, as specified under section 8 of this rule, is implemented.

(5) The plan must identify any computer data management or statistical evaluation program used by the owner, operator, or permittee and, upon request by the commissioner, include appropriate documentation of the computer program.

(d) Changes to the statistical evaluation plan must not be implemented without approval from the commissioner.

(e) The owner, operator, or permittee shall submit a statistical evaluation report of the ground water sample analysis to the commissioner. The report must be submitted within sixty (60) days after obtaining ground water samples from the ground water monitoring wells, unless a verification resampling program described under section 8 of this rule, is implemented. The statistical evaluation report must include the following:

- (1) All input data, output data, and equations used for all calculations and statistical tests utilized.
- (2) A detailed discussion of the conclusions from the statistical evaluation. This discussion must include the identification of all constituents found to have a statistically significant increase.
- (3) A graphical representation of the MSWLF's ground water data when requested by the commissioner. The commissioner shall **provide**

be chosen for the statistical evaluation, provided the chosen statistical procedure is capable of meeting the performance standards in subsection (g):

- (1) A parametric analysis of variance (ANOVA) followed by multiple comparison procedures to identify a statistically significant increase. The method must include estimation and testing of the contrasts between each downgradient ground water monitoring well's mean and the background mean levels for each constituent.
- (2) An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each downgradient ground water monitoring well's median and the background ground water quality median levels for each constituent.
- (3) A tolerance or prediction interval in which an interval for each constituent is established from the distribution of the background ground water quality data, and the level of each constituent in each downgradient ground water monitoring well for the most recent sampling event is compared to the upper tolerance limit or upper prediction limit.
- (4) A control chart, which establishes control limits for each constituent.
- (5) A temporal or spatial trend analysis.
- (6) Another valid statistical test method that meets the performance standards of subsection (g).

(g) The statistical procedures and methods used must comply with the following performance standards:

- (1) The statistical procedure used to evaluate ground water monitoring data must be appropriate for the data distribution of each constituent. If the data distribution of a constituent is shown to be inappropriate for a normal theory test, then either the data must be transformed or a distribution-free statistical test must be used. If data distributions for the constituents differ, more than one (1) statistical method may be needed.
- (2) If ground water data from an individual **ground water** monitoring well is compared either to background ground water quality, which may include pooled ~~upgradient ground water~~ **background** monitoring well data from more than one (1) well, or to a ground water protection standard, then the test must be done at a Type I error level that is no less than one-hundredth (0.01) for each testing period. If a multiple

~~guidance in preparing graphics~~ **specify the format of the graphical representation.**

(f) Any of the following statistical procedures may be chosen for the statistical evaluation, provided the chosen statistical procedure is capable of meeting the performance standards in subsection (g):

- (1) A parametric analysis of variance (ANOVA) followed by multiple comparison procedures to identify a statistically significant increase. The method must include estimation and testing of the contrasts between each downgradient ground water monitoring well's mean and the background mean levels for each constituent.
- (2) An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each downgradient ground water monitoring well's median and the background ground water quality median levels for each constituent.
- (3) A tolerance or prediction interval in which an interval for each constituent is established from the distribution of the background ground water quality data, and the level of each constituent in each downgradient ground water monitoring well for the most recent sampling event is compared to the upper tolerance limit or upper prediction limit.
- (4) A control chart, which establishes control limits for each constituent.
- (5) A temporal or spatial trend analysis.
- (6) Another valid statistical test method that meets the performance standards of subsection (g).

(g) The statistical procedures and methods used must comply with the following performance standards:

- (1) The statistical procedure used to evaluate ground water monitoring data must be appropriate for the data distribution of each constituent. If the data distribution of a constituent is shown to be inappropriate for a normal theory test, then either the data must be transformed or a distribution-free statistical test must be used. If data distributions for the constituents differ, more than one (1) statistical method may be needed.
- (2) If ground water data from an individual **ground water** monitoring well is compared either to background ground water quality, which may include pooled ~~upgradient ground water~~ **background** monitoring well data from more than one (1) well, or to a ground water protection standard, then the test must be done at a Type I error level that is no less

comparisons procedure is used, the Type I experiment wise error rate for each testing period must be no less than five-hundredths (0.05); however, the Type I error rate of no less than one-hundredth (0.01) for individual **monitoring** well comparisons must be maintained. This performance standard does not apply to:

- (A) tolerance intervals;
- (B) prediction intervals; and
- (C) control charts.

(3) The validity of the statistical test used must be evaluated prior to applying the method to the ground water data. This evaluation must address:

- (A) the error potential for false positives and false negatives; and
- (B) any other evaluation deemed necessary by the commissioner.

(4) If a control chart is used to evaluate ground water monitoring data, the specific type of control chart and associated statistical parameter values must be protective of human health **and or** the environment. These values must be determined after considering:

- (A) the number of background samples;
- (B) the background data distribution; and
- (C) the range of background concentrations for each constituent analyzed.

(5) If a tolerance interval or a prediction interval is used to evaluate ground water monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, must be protective of human health **and or** the environment. These statistical parameters must be determined after considering:

- (A) the number of background samples;
- (B) the background data distribution; and
- (C) the range of background concentrations for each constituent analyzed.

(6) The statistical method must account for data below the limit of detection with one (1) or more statistical procedures. Any practical quantitation limit that is used in a statistical procedure must:

- (A) be the lowest concentration limit that can be repeatedly and reliably achieved; and
- (B) be within specified limits of precision and accuracy during routine laboratory operating conditions.

(7) If necessary, the statistical method must include procedures to control or correct for seasonal and spatial variability.

than one-hundredth (0.01) for each testing period. If a multiple comparisons procedure is used, the Type I experiment wise error rate for each testing period must be no less than five-hundredths (0.05); however, the Type I error rate of no less than one-hundredth (0.01) for individual **monitoring** well comparisons must be maintained. This performance standard does not apply to:

- (A) tolerance intervals;
- (B) prediction intervals; and
- (C) control charts.

(3) The validity of the statistical test **method** used must be evaluated prior to applying the method to the ground water data. This evaluation must address:

- (A) the error potential for false positives and false negatives; and
- (B) any other evaluation deemed necessary by the commissioner **to confirm that the test method chosen will sufficiently detect contamination.**

(4) If a control chart is used to evaluate ground water monitoring data, the specific type of control chart and associated statistical parameter values must be protective of human health **and or** the environment. These values must be determined after considering:

- (A) the number of background samples;
- (B) the background data distribution; and
- (C) the range of background concentrations for each constituent analyzed.

(5) If a tolerance interval or a prediction interval is used to evaluate ground water monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, must be protective of human health and the environment. These statistical parameters must be determined after considering:

- (A) the number of background samples;
- (B) the background data distribution; and
- (C) the range of background concentrations for each constituent analyzed.

(6) The statistical method must account for data below the limit of detection with one (1) or more statistical procedures. Any practical quantitation limit that is used in a statistical procedure must:

- (A) be the lowest concentration limit that can be repeatedly and reliably achieved; and
- (B) be within specified limits of precision and accuracy during routine laboratory operating conditions.

(7) If necessary, the statistical method must include procedures to control or correct for seasonal and spatial variability.

329 IAC 10-21-7 Detection ground water monitoring program

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 7. (a) A detection ground water monitoring program that satisfies the following requirements is required for all MSWLFs:

(1) Within the six (6) months following the scheduled date of compliance that is specified in section 1(a) of this rule, a minimum of four (4) independent background samples from each approved ground water monitoring well must be collected and analyzed for the constituents listed in section 15(a) of this rule (Table 1A). If a background data base, comprising data from every monitoring well approved by the commissioner and every constituent listed in section 15(a) of this rule (Table 1A), has been previously established, then additional independent samples are not required for the purpose of establishing background.

(2) Any **ground water monitoring** well installed after the scheduled date of compliance specified in section 1(a) of this rule and designated for detection monitoring must have minimum number of independent samples collected and analyzed for the constituents listed in section 15(a) of this rule (Table 1A). The minimum number of independent samples must satisfy the chosen statistical procedures and performance standards under section 6 of this rule.

(3) Subsequent sampling events during the active life, closure, and post-closure periods of the MSWLF must include the collection and analysis of at least one (1) independent sample from each approved **ground water** monitoring well. These samples must be analyzed for all constituents in section 15 of this rule (Table 1A and Table 1B). The detection monitoring frequency must be at least semiannual during the active life, closure, and post-closure periods.

(4) The commissioner may specify an alternative frequency for detection monitoring that must comply with the following:

- (A) The alternative frequency must be no less than annual.
- (B) The alternative frequency must be based on consideration of the following factors:
 - (i) Sedimentology of the aquifer and unsaturated zone.
 - (ii) Hydraulic conductivity of the aquifer and unsaturated zone.
 - (iii) Ground water flow rates.

329 IAC 10-21-7 Detection ground water monitoring program

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 7. (a) A detection ground water monitoring program that satisfies the following requirements is required for all MSWLFs:

(1) Within the six (6) months following the scheduled date of compliance that is specified in section 1(a) of this rule, a minimum of four (4) independent background samples from each approved ground water monitoring well must be collected and analyzed for the constituents listed in section 15(a) of this rule (Table 1A). If a background data base, comprising data from every monitoring well approved by the commissioner and every constituent listed in section 15(a) of this rule (Table 1A), has been previously established, then additional independent samples are not required for the purpose of establishing background.

(2) Any **ground water monitoring** well installed after the scheduled date of compliance specified in section 1(a) of this rule and designated for detection monitoring must have minimum number of independent samples collected and analyzed for the constituents listed in section 15(a) of this rule (Table 1A). The minimum number of independent samples must satisfy the chosen statistical procedures and performance standards under section 6 of this rule.

(3) Subsequent sampling events during the active life, closure, and post-closure periods of the MSWLF must include the collection and analysis of at least one (1) independent sample from each approved **ground water** monitoring well. These samples must be analyzed for all constituents in section 15 of this rule (Table 1A and Table 1B). The detection monitoring frequency must be at least semiannual during the active life, closure, and post-closure periods.

(4) The commissioner may specify an alternative frequency for detection monitoring that must comply with the following:

- (A) The alternative frequency must be no less than annual.
- (B) The alternative frequency must be based on consideration of the following factors:
 - (i) Sedimentology of the aquifer and unsaturated zone.
 - (ii) Hydraulic conductivity of the aquifer and unsaturated zone.
 - (iii) Ground water flow rates.
 - (iv) Minimum distance between the upgradient permitted solid waste

- (iv) Minimum distance between the upgradient permitted solid waste boundary and the downgradient ground water monitoring well screen.
 - (v) Resource value of the aquifer.
 - (vi) The fate and mode of transport of any constituents detected in response to detection monitoring.
 - (vii) Constituent concentrations recorded at the date of alternative frequency selection.
- (5) The owner, operator, or permittee must determine, based on the results of sample collection and analysis performed in accordance with this subsection, whether any statistically significant increase in concentration has occurred for any constituent listed in section 15(a) of this rule (Table 1A). In order to make this determination, the owner, operator, or permittee must compare the samples to:
- (A) background ground water quality;
 - (B) a ground water protection standard that has been established from a previous assessment ground water monitoring program conducted under section 10 of this rule; or
 - (C) a ground water protection standard that was established under 329 IAC 2-16-10, which was repealed in 1996.
- (b) If a ~~statistically significant increase~~ **preliminary exceedance** in a constituent concentration has been determined, through ground water detection monitoring performed in accordance with subsection (a), the owner, operator, or permittee must accomplish the following:
- (1) Notify the commissioner within fourteen (14) days of the determination. The notification must include the following:
 - (A) Those constituents listed in section 15(a) of this rule (Table 1A) for which a ~~statistically significant increase~~ **preliminary exceedance** in concentration has been observed and the last recorded concentration for each of those constituents.
 - (B) The identification of each ground water monitoring well where a ~~statistically significant increase~~ **preliminary exceedance** was observed.
 - (C) Whether verification procedures and sampling as described under section 8 of this rule will be pursued.
 - (2) Establish, within ninety (90) days of determination of a statistically significant increase,

- boundary and the downgradient ground water monitoring well screen.
 - (v) Resource value of the aquifer.
 - (vi) The fate and mode of transport of any constituents detected in response to detection monitoring.
 - (vii) Constituent concentrations recorded at the date of alternative frequency selection.
- (5) The owner, operator, or permittee must determine, based on the results of sample collection and analysis performed in accordance with this subsection, whether any statistically significant increase in concentration has occurred for any constituent listed in section 15(a) of this rule (Table 1A). In order to make this determination, the owner, operator, or permittee must compare the samples to:
- (A) background ground water quality;
 - (B) a ground water protection standard that has been established from a previous assessment ground water monitoring program conducted under section 10 of this rule; or
 - (C) a ground water protection standard that was established under 329 IAC 2-16-10, which was repealed in 1996.
- (b) If a ~~statistically significant increase~~ **preliminary exceedance** in a constituent concentration has been determined, through ground water detection monitoring performed in accordance with subsection (a), the owner, operator, or permittee must accomplish the following:
- (1) Notify the commissioner within fourteen (14) days of the determination. The notification must include the following:
 - (A) Those constituents listed in section 15(a) of this rule (Table 1A) for which a ~~statistically significant increase~~ **preliminary exceedance** in concentration has been observed and the last recorded concentration for each of those constituents.
 - (B) The identification of each ground water monitoring well where a ~~statistically significant increase~~ **preliminary exceedance** was observed.
 - (C) Whether verification procedures and sampling as described under section 8 of this rule will be pursued.
 - (2) Establish, within ninety (90) days of determination of a statistically significant increase, an assessment ground water monitoring program that meets the requirements of section 10 of this rule unless the owner, operator, or permittee chooses:

an assessment ground water monitoring program that meets the requirements of section 10 of this rule unless the owner, operator, or permittee chooses:

- (A) to institute a verification program, pursuant to section 8 of this rule; or
- (B) to demonstrate, pursuant to section 9 of this rule.

(c) A corrective action program may be required during a detection monitoring program if a ~~verified statistically significant increase~~ **preliminary exceedance is verified and is** attributable to the MSWLF and is an increase over either of the following:

- (1) A ground water protection standard that has been established from a previous assessment ground water monitoring program conducted under section 10 of this rule.
- (2) A ground water protection standard that was established under 329 IAC 2-16-10, which was repealed in 1996, for any constituent listed in section 15(a) of this rule (Table 1A).

(d) If, pursuant to subsection (c), the commissioner determines that a corrective action program is necessary, the owner, operator, or permittee must notify all pertinent local government officials of this determination.

(e) If the field pH for any ground water sample obtained at the monitoring boundary is determined to be above ten (10) or below five (5) standard pH units, the owner, operator, or permittee shall:

- (1) within fourteen (14) days of the determination, notify the commissioner, in writing, of the identity of the **ground water monitoring** well or wells whose samples indicated an anomalous pH level, and of the corresponding pH values of those samples; and
- (2) within sixty (60) days of the determination, submit a written report explaining the anomalous pH values to the commissioner. After reviewing the report, the commissioner may determine that an assessment ground water monitoring program, described under section 10 of this rule, is necessary.

(f) During detection monitoring, if arsenic (dissolved) is determined to exceed the MCL for arsenic for any ground water sample obtained at the monitoring boundary, the owner, operator, or

- (A) to institute a verification program, pursuant to section 8 of this rule; or
- (B) to demonstrate, pursuant to section 9 of this rule.

(c) A corrective action program may be required during a detection monitoring program if a ~~verified statistically significant increase~~ **preliminary exceedance is verified and is** attributable to the MSWLF and is an increase over either of the following:

- (1) A ground water protection standard that has been established from a previous assessment ground water monitoring program conducted under section 10 of this rule.
- (2) A ground water protection standard that was established under 329 IAC 2-16-10, which was repealed in 1996, for any constituent listed in section 15(a) of this rule (Table 1A).

(d) If, pursuant to subsection (c), the commissioner determines that a corrective action program is necessary, the owner, operator, or permittee must notify all pertinent local government officials, **including the county commissioner, officials of the solid waste management district, and the county health department**, of this determination.

(e) If the field pH for any ground water sample obtained at the monitoring boundary is determined to be above ten (10) or below five (5) standard pH units, the owner, operator, or permittee shall:

- (1) within fourteen (14) days of the determination, notify the commissioner, in writing, of the identity of the **ground water monitoring** well or wells whose samples indicated an anomalous pH level, and of the corresponding pH values of those samples; and
- (2) within sixty (60) days of the determination, submit a written report explaining the anomalous pH values to the commissioner. After reviewing the report, the commissioner may determine that an assessment ground water monitoring program, described under section 10 of this rule, is necessary.

(f) During detection monitoring, if arsenic (dissolved) is determined to exceed the MCL or, if established, the ground water protection standard for arsenic for any ground water sample obtained at the monitoring boundary, the owner, operator, or permittee shall notify the commissioner in writing within fourteen (14) days of the

permittee shall do the following:

- (1) Within fourteen (14) days of the determination, notify the commissioner, in writing, of the identity of the ground water monitoring well or wells whose samples indicated concentration greater than the MCL.
- (2) Within sixty (60) days of the determination, submit a written report to the commissioner explaining the high arsenic values. After reviewing the report, the commissioner may determine that an assessment ground water monitoring program or a corrective action program, described under section 10 or 13 of this rule, respectively, is necessary.

329 IAC 10-21-8 Verification of a statistically significant increase in constituent concentration

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 8. (a) The owner, operator, or permittee shall develop a verification resampling and analysis plan that will provide verification that a ~~statistically significant increase~~ **preliminary exceedance** has occurred in the concentration of one or more constituents during detection or assessment monitoring programs. This plan must:

- (1) use the statistical procedures and performance standards described in section 6 of this rule to determine:
 - (A) the number of resamples that must be collected for verification of a ~~statistically significant increase~~ **preliminary exceedance** in constituent concentration; and
 - (B) the number of resamples that must fail in order to verify the ~~statistically significant increase;~~ **preliminary exceedance;**
- (2) identify the MSWLF-wide false positive rate and the per-comparison false positive rate;
- (3) demonstrate that there is an acceptable balance between the false positive rate and the false negative rate;
- (4) be approved by the commissioner prior to implementation; and
- (5) after approval by the commissioner, be incorporated into the statistical evaluation plan.

(b) Until the owner, operator, or permittee obtains approval for a proposed verification resampling and analysis plan, a minimum of two (2) independent samples must be collected when verification of a statistically significant increase is attempted.

determination. The notification must include the following:

- (1) The identification of each ground water monitoring well where samples indicated a concentration greater than the MCL or, if established, the ground water protection standard for arsenic.
- (2) And, whether:
 - (A) assessment monitoring and corrective action programs under 329 IAC 10-21-10 and 329 IAC 10-21-13 are to be initiated; or
 - (B) a demonstration, as described under section 9 of this rule, will be pursued while maintaining a detection monitoring program.

329 IAC 10-21-8 Verification of a statistically significant increase in constituent concentration

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 8. (a) The owner, operator, or permittee ~~shall~~ **may** develop a verification resampling and analysis plan that will provide verification that a ~~statistically significant increase~~ **preliminary exceedance** has occurred in the concentration of one or more constituents during detection or assessment monitoring programs. This plan must:

- (1) use the statistical procedures and performance standards described in section 6 of this rule to determine:
 - (A) the number of resamples that must be collected for verification of a ~~statistically significant increase~~ **preliminary exceedance** in constituent concentration; and
 - (B) the number of resamples that must fail in order to verify the ~~statistically significant increase;~~ **preliminary exceedance;**
- (2) identify the MSWLF-wide false positive rate and the per-comparison false positive rate;
- (3) demonstrate that there is an acceptable balance between the false positive rate and the false negative rate;
- (4) be approved by the commissioner prior to implementation; and
- (5) after approval by the commissioner, be incorporated into the statistical evaluation plan.

(b) Until the owner, operator, or permittee obtains approval for a proposed verification resampling and analysis plan, a minimum of two (2) independent samples must be collected when verification of a statistically significant increase is attempted.

(c) Until the owner, operator, or permittee obtains approval for a verification resampling plan, the commissioner shall consider ~~an observed statistically significant increase~~ **a preliminary exceedance** to be verified if:

- (1) any of the verification resamples confirm a statistically significant increase over background ground water quality; or
- (2) the owner, operator, or permittee chooses not to institute a verification resampling program.

(d) Within fourteen (14) days following the verification resampling determination, the owner, operator, or permittee shall notify the commissioner, in verbal or written format, of the following:

- (1) The results of the verification resampling and analysis program.
- (2) An intention, on the part of the owner, operator, or permittee to submit a demonstration pursuant to section 9 of this rule.

(e) The detection ground water monitoring program or the assessment ground water monitoring program shall continue throughout the verification resampling program. Progression to an assessment or corrective action ground water monitoring program shall be based on the verification resampling results, regardless of subsequent detection monitoring results if the verification resampling program extends into the next scheduled sampling event.

(f) Following the completion of a verification resampling program, a report must be submitted to the commissioner no later than sixty (60) days following the last verification resampling event or thirty (30) days prior to the next scheduled semiannual sampling event, whichever occurs first. This report must be written and include the following:

- (1) All information required under section 1(t) of this rule.
- (2) The date the commissioner was notified as required in subsection (d).
- (3) Whether the ground water monitoring program will:
 - (A) remain in detection monitoring or assessment monitoring;
 - (B) initiate an assessment monitoring program; or
 - (C) initiate a corrective action program.
- (4) Whether the owner, operator, or permittee intends to make a demonstration pursuant to section 9 of this rule.
- (5) Results of the verification resampling,

(c) Until the owner, operator, or permittee obtains approval for a verification resampling plan, the commissioner shall consider ~~an observed statistically significant increase~~ **a preliminary exceedance** to be verified if:

- (1) any of the verification resamples confirm a statistically significant increase over background ground water quality; or
- (2) the owner, operator, or permittee chooses not to institute a verification resampling program.

(d) Within fourteen (14) days following the verification resampling determination, the owner, operator, or permittee shall notify the commissioner, ~~in verbal or written format,~~ of the following:

- (1) The results of the verification resampling and analysis program.
- (2) An intention, on the part of the owner, operator, or permittee to submit a demonstration pursuant to section 9 of this rule.

(e) The detection ground water monitoring program or the assessment ground water monitoring program shall continue throughout the verification resampling program. Progression to an assessment or corrective action ground water monitoring program shall be based on the verification resampling results, regardless of subsequent detection monitoring results if the verification resampling program extends into the next scheduled sampling event.

(f) Following the completion of a verification resampling program, a report must be submitted to the commissioner no later than sixty (60) days following the last verification resampling event or thirty (30) days prior to the next scheduled semiannual sampling event, whichever occurs first. This report must be written and include the following:

- (1) All information required under section 1~~(t)~~**(s)** of this rule.
- (2) The date the commissioner was notified as required in subsection (d).
- (3) Whether the ground water monitoring program will:
 - (A) remain in detection monitoring or assessment monitoring;
 - (B) ~~initiate advance into~~ an assessment monitoring program; or
 - (C) ~~initiate advance into~~ a corrective action program.
- (4) Whether the owner, operator, or permittee intends to make a demonstration pursuant to section 9 of this rule.

including information required by section 1(t)(3) through 1(t)(5) of this rule.

(g) If the verification sampling program determines that a statistically significant increase did occur, the owner, operator, or permittee:

- (1) must initiate an assessment ground water monitoring program that meets the requirements of section 10 of this rule or a corrective action program that meets the requirements of section 13 of this rule, whichever program is applicable; or
- (2) may choose to make a demonstration pursuant to section 9 of this rule, while maintaining a detection monitoring program.

(h) The commissioner may approve an extension of the submittal deadlines required by subsection (f) if the owner, operator, or permittee:

- (1) requests an extension; and
- (2) provides an **adequate** explanation for the need of an extension.

329 IAC 10-21-9 Demonstration that a statistically significant increase or contamination is not attributable to a municipal solid waste land disposal facility unit

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 9. (a) If a **verified** statistically significant increase in a constituent concentration has been determined, the owner, operator, or permittee may demonstrate that the **verified** statistically significant increase was caused by:

- (1) a source other than the MSWLF unit;
- (2) an error in sampling technique, laboratory analysis, or statistical evaluation; or
- (3) natural variation in ground water quality.

(b) If the owner, operator, or permittee intends to make a demonstration under this section, the owner, operator, or permittee shall submit, within fourteen (14) days of verifying a statistically significant increase, a plan that describes:

- (1) the general approach that will demonstrate that the MSWLF unit did not cause the verified statistical increase; and
- (2) a schedule to complete the demonstration. Based on previous ground water data and the thoroughness of the plan submitted under subdivision (1), the commissioner may modify the proposed schedule.

(5) Results of the verification resampling, including information required by section 1(~~t~~)(s)(3) through 1(~~t~~)(s)(5) of this rule.

(g) If ~~the~~ verification sampling ~~program~~ determines that a statistically significant increase did occur, the owner, operator, or permittee:

- (1) must initiate an assessment ground water monitoring program that meets the requirements of section 10 of this rule or a corrective action program that meets the requirements of section 13 of this rule, whichever program is applicable; or
- (2) may choose to make a demonstration pursuant to section 9 of this rule, while maintaining a detection monitoring program.

(h) The commissioner may approve an extension of the submittal deadlines required by subsection (f) if the owner, operator, or permittee:

- (1) requests an extension; and
- (2) provides an **adequate** explanation for the need of an extension.

329 IAC 10-21-9 Demonstration that a statistically significant increase or contamination is not attributable to a municipal solid waste land disposal facility unit

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 9. (a) If a **verified** statistically significant increase in a constituent concentration has ~~been determined~~ **occurred**, the owner, operator, or permittee may demonstrate that the **verified** statistically significant increase was caused by:

- (1) a source other than the MSWLF unit;
- (2) an error in sampling technique, laboratory analysis, or statistical evaluation; or
- (3) natural variation in ground water quality.

(b) If the owner, operator, or permittee intends to make a demonstration under this section, the owner, operator, or permittee shall submit, within fourteen (14) days of verifying a statistically significant increase, a plan that describes:

- (1) the general approach that will demonstrate that the MSWLF unit did not cause the verified statistical increase; and
- (2) a schedule to complete the demonstration. Based on previous ground water data and the thoroughness of the plan submitted under subdivision (1), the commissioner may modify the proposed schedule.

(c) If a demonstration is approved by the commissioner, the owner, operator, or permittee may continue detection ground water monitoring or assessment ground water monitoring, whichever is applicable.

(d) If the owner, operator, or permittee is unable to submit a successful demonstration is not approved based on items listed in subsection (a), or the demonstration is not submitted within the time frame specified in subsection (b)(2), then the owner, operator, or permittee shall initiate either an assessment ground water monitoring program or a corrective action program, whichever program is applicable. The owner, operator, or permittee may continue the demonstration process while implementing an assessment ground water monitoring program or a corrective action program, whichever is applicable. If, subsequently, the extended demonstration process proves that the MSWLF unit is not the source of the verified statistically significant increase, the MSWLF unit may return to detection monitoring or assessment monitoring provided there have been no other verified statistically significant increases.

(e) If a successful demonstration is not submitted within the time frame identified in subsection (b)(2); the owner, operator, or permittee may extend the demonstration process while implementing an assessment ground water monitoring program or a corrective action program, whichever is applicable. If, subsequently, the extended demonstration process proves successful, the MSWLF unit may return to detection monitoring or assessment monitoring, pursuant to section 7 of this rule, provided there have been no other verified statistically significant increases.

(f) (e) The detection monitoring program or the assessment monitoring program, whichever is applicable, must be continued throughout the demonstration period identified in subsection (b)(2).

(g) (f) The commissioner shall consider that a statistically significant increase is attributable to the MSWLF unit if the owner, operator, or permittee chooses not to demonstrate pursuant to this section.

(c) If a demonstration is approved by the commissioner, the owner, operator, or permittee may continue detection ground water monitoring or assessment ground water monitoring, whichever is applicable.

(d) If the owner, operator, or permittee is unable to submit a successful demonstration is not approved based on items listed in subsection (a), or the demonstration is not submitted within the time frame specified in subsection (b)(2), then the owner, operator, or permittee shall initiate either an assessment ground water monitoring program or a corrective action program, whichever program is applicable. The owner, operator, or permittee may continue the demonstration process while implementing an assessment ground water monitoring program or a corrective action program, whichever is applicable. If, subsequently, the extended demonstration process proves that the MSWLF unit is not the source of the verified statistically significant increase, the MSWLF unit may return to detection monitoring or assessment monitoring provided there have been no other verified statistically significant increases.

(e) If a successful demonstration is not submitted within the time frame identified in subsection (b)(2); the owner, operator, or permittee may extend the demonstration process while implementing an assessment ground water monitoring program or a corrective action program, whichever is applicable. If, subsequently, the extended demonstration process proves successful, the MSWLF unit may return to detection monitoring or assessment monitoring, pursuant to section 7 of this rule, provided there have been no other verified statistically significant increases.

(f) (e) The detection monitoring program or the assessment monitoring program, whichever is applicable, must be continued throughout the demonstration period identified in subsection (b)(2).

(g) (f) The commissioner shall consider that a statistically significant increase is attributable to the MSWLF unit if the owner, operator, or permittee chooses not to demonstrate pursuant to this section.

329 IAC 10-21-10 Assessment ground water monitoring program

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 10. (a) Establishment of an assessment ground water monitoring program is required upon any of the following circumstances:

- (1) When the owner, operator, or permittee has verified that a statistically significant increase over background levels has occurred for any constituent listed in section 15(a) of this rule (Table 1A) at any ground water monitoring well at the monitoring boundary of the MSWLF unit, and a demonstration pursuant to section 9 of this rule has not been approved by the commissioner.
- (2) When the owner, operator, or permittee is engaged in a corrective action program specified under section 13 of this rule.
- (3) When the owner, operator or permittee of an existing MSWLF is conducting, as of the effective date of this article, a Phase II ground water monitoring program as specified under 329 IAC 2-16, which was repealed in 1996.

(b) The owner, operator, or permittee shall conduct an assessment ground water monitoring program in accordance with the following requirements:

- (1) Within ninety (90) days after determining that the owner, operator, or permittee of an MSWLF must conduct assessment ground water monitoring, all **ground water monitoring** wells containing constituents with statistically significant elevated concentrations, and all ~~their~~ **adjacent ground water monitoring wells within six hundred (600) feet of the well with the statistically significant elevated concentrations and monitoring the same hydrogeologic unit of the well with the elevated concentrations** must be sampled and analyzed for all constituents listed in section 16 of this rule (Table 2). If deemed necessary, the commissioner may require samples to be collected and analyzed from additional **monitoring** wells.
- (2) Within fourteen (14) days after receiving certified laboratory results from the final sampling conducted under subdivision (1), the owner, operator, or permittee shall submit to the commissioner written notification of the following information for any constituent listed in section 16 of this rule (Table 2) that is detected:

- (A) The identity and recorded concentration of the constituent.

329 IAC 10-21-10 Assessment ground water monitoring program

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 10. (a) Establishment of an assessment ground water monitoring program is required upon any of the following circumstances:

- (1) When the owner, operator, or permittee has verified that a statistically significant increase over background levels has occurred for any constituent listed in section 15(a) of this rule (Table 1A) at any ground water monitoring well at the monitoring boundary of the MSWLF unit, and a demonstration pursuant to section 9 of this rule has not been approved by the commissioner.
- (2) When the owner, operator, or permittee is engaged in a corrective action program specified under section 13 of this rule.
- (3) When the owner, operator, or permittee of an existing MSWLF is conducting, as of ~~the effective date of this article~~ **April 13, 1996**, a Phase II ground water monitoring program as specified under 329 IAC 2-16, which was repealed in 1996.

(b) The owner, operator, or permittee shall conduct an assessment ground water monitoring program in accordance with the following requirements:

- (1) Within ninety (90) days after determining that the owner, operator, or permittee of an MSWLF must conduct assessment ground water monitoring, all **ground water monitoring** wells containing constituents with statistically significant elevated concentrations, and all ~~their adjacent~~ **ground water monitoring wells within six hundred (600) feet of the well with the statistically significant elevated concentrations and monitoring the same hydrogeologic unit of the well with the elevated concentrations**, must be sampled and analyzed for all constituents listed in section 16 of this rule (Table 2). ~~If deemed necessary~~, The commissioner may require samples to be collected and analyzed from additional **monitoring** wells.
- (2) Within fourteen (14) days after receiving certified laboratory results from the final sampling conducted under subdivision (1), the owner, operator, or permittee shall submit to the commissioner written notification of the following information for any constituent listed in section 16 of this rule (Table 2) that is detected:
 - (A) The identity and recorded concentration of the constituent.

- (B) The identity of each ground water monitoring well where the constituent was detected.
- (3) A copy of the notification required under subdivision (2) and a copy of the certified laboratory results must be placed in the operating record within thirty (30) days of receiving the original certified laboratory results.
- (4) The owner, operator, or permittee shall collect and analyze a minimum of four (4) independent samples from each ground water monitoring well identified in subdivision (2) in order to establish background ground water quality. Certified laboratory analyses of the independent ground water samples must be submitted to the commissioner no later than thirty (30) days prior to the next scheduled semiannual sampling event.
- (5) The owner, operator, or permittee shall establish a ground water protection standard as described in section 11 of this rule for any constituent that has been detected in ground water samples collected under subdivision (1).
- (6) The owner, operator, or permittee shall, during subsequent sampling events, collect at least one (1) independent sample from each **ground water monitoring** well designated to be in an assessment monitoring program as identified in subdivision (2)(B). Each independent sample must be analyzed for all constituents detected and identified in subdivision (2)(A).
- (c) For sampling events during assessment ground water monitoring, the commissioner may do the following:
- (1) Specify an appropriate subset of ground water monitoring wells to sample and analyze for constituents in section 16 of this rule (Table 2).
- (2) Specify a constituent or constituents from section 16 of this rule (Table 2) that may be deleted from the constituent monitoring list upon demonstration by the owner, operator, or permittee that the constituent to be deleted is:
- (A) not reasonably expected to be in the solid waste;
- (B) not derived from the solid waste;
- (C) naturally occurring in the soil that underlies the site and would be soluble in ground water at the detected levels, even in the absence of the MSWLF unit; ~~or~~ **and**
- (D) not a constituent of concern based on historical ground water quality.
- (3) Specify a constituent or constituents that may be added to the ~~constituent~~ **assessment** monitoring

- (B) The identity of each ground water monitoring well where the constituent was detected.
- (3) A copy of the notification required under subdivision (2) and a copy of the certified laboratory results must be placed in the operating record within thirty (30) days of receiving the original certified laboratory results.
- (4) The owner, operator, or permittee shall collect and analyze a minimum of four (4) independent samples from each ground water monitoring well identified in subdivision (2) in order to establish background ground water quality. Certified laboratory analyses of the independent ground water samples must be submitted to the commissioner no later than thirty (30) days prior to the next scheduled semiannual sampling event.
- (5) The owner, operator, or permittee shall establish a ground water protection standard as described in section 11 of this rule for any constituent that has been detected in ground water samples collected under subdivision (1).
- (6) The owner, operator, or permittee shall, during subsequent sampling events, collect at least one (1) independent sample from each **ground water monitoring** well designated to be in an assessment monitoring program as identified in subdivision (2)(B). Each independent sample must be analyzed for all constituents detected and identified in subdivision (2)(A).
- (c) For sampling events during assessment ground water monitoring, the commissioner may do the following:
- (1) Specify an appropriate subset of ground water monitoring wells to sample and analyze for constituents in section 16 of this rule (Table 2).
- (2) Specify a constituent or constituents from section 16 of this rule (Table 2) that may be deleted from the constituent monitoring list upon demonstration by the owner, operator, or permittee that the constituent to be deleted is:
- (A) not reasonably expected to be in the solid waste;
- (B) not derived from the solid waste;
- (C) naturally occurring in the soil that underlies the site and would be soluble in ground water at the detected levels, even in the absence of the MSWLF unit; ~~or~~ **and**
- (D) not a constituent of concern based on historical ground water quality.
- (3) Specify a constituent or constituents that may be added to the ~~constituent~~ **assessment** monitoring

constituent list, based on historical, ground water quality, **analysis of leachate derived from the MSWLF**, or wastes placed in the MSWLF unit.

(4) Specify an alternate frequency for repeated sampling and analysis of the ground water for the full set of constituents in section 16 of this rule (Table 2). The sampling frequency for constituents in section 15 (Table 1A and Table 1B) may be altered, provided it is at least an annual frequency. The alternate frequency must continue throughout the active life, closure, and post-closure care periods of the MSWLF. The alternate frequency must be based on consideration of the following factors:

- (A) Sedimentology of the aquifer and unsaturated zone.
- (B) Hydraulic conductivity of the aquifer and unsaturated zone.
- (C) Ground water flow rates.
- (D) Minimum distance between upgradient solid waste boundary of the MSWLF unit and downgradient monitoring well screen.
- (E) Resource value of the aquifer.
- (F) The fate of any constituents detected.
- (G) The mode of transport of any detected constituents.
- (H) Ground water quality data.
- (I) Other information as required by the commissioner for the demonstration.

(d) After establishing background ground water quality described in subsection (b)(4), subsequent semiannual sampling events must include the following:

- (1) At least one (1) independent sample from all the ground water monitoring wells that are included in both detection and assessment ground water monitoring programs and any other **monitoring** wells specified by the commissioner.
- (2) Analysis for all constituents included in both detection and assessment ground water monitoring programs.
- (3) **Determination if there is a verified statistically significant increase for all constituents identified in subdivision (2). The determination shall be in accordance with section 6 of this rule and subsection (f).**
- ~~(3)~~ (4) Submittal of the information required in section 1(t) of this rule.

(e) Starting from the date that an assessment ground water monitoring program is required, ground water samples must be collected and analyzed for all

constituent list, based on historical; ground water quality, **analysis of leachate derived from the MSWLF**, ~~or~~ wastes placed in the MSWLF unit.

(4) Specify an alternate frequency for repeated sampling and analysis of the ground water for the full set of constituents in section 16 of this rule (Table 2). The sampling frequency for constituents in section 15 (Table 1A and Table 1B) may be altered, provided it is at least an annual frequency. The alternate frequency must continue throughout the active life, closure, and post-closure care periods of the MSWLF. The alternate frequency must be based on consideration of the following factors:

- (A) Sedimentology of the aquifer and unsaturated zone.
- (B) Hydraulic conductivity of the aquifer and unsaturated zone.
- (C) Ground water flow rates.
- (D) Minimum distance between upgradient solid waste boundary of the MSWLF unit and downgradient monitoring well screen.
- (E) Resource value of the aquifer.
- (F) The fate of any constituents detected.
- (G) The mode of transport of any detected constituents.
- (H) Ground water quality data.
- (I) Other information as required by the commissioner for the demonstration.

(d) After establishing background ground water quality described in subsection (b)(4), subsequent semiannual sampling events must include the following:

- (1) At least one (1) independent sample from all the ground water monitoring wells that are included in both detection and assessment ground water monitoring programs and any other **monitoring** wells specified by the commissioner.
- (2) Analysis for all constituents included in both detection and assessment ground water monitoring programs.
- (3) **Determination if there is a verified statistically significant increase for all constituents identified in subdivision (2). The determination shall be in accordance with section 6 of this rule and subsection (f).**
- ~~(3)~~ (4) Submittal of the information required in section 1~~(t)~~(s) of this rule.

(e) Starting from the date that an assessment ground water monitoring program is required, ground water samples must be collected and analyzed for all constituents in section 16 of this rule (Table 2) on an

constituents in section 16 of this rule (Table 2) on an annual basis, or at an alternate frequency specified by the commissioner. Samples for assessment monitoring must be collected from each **ground water monitoring** well identified in subsection (b)(2)(B). For these sampling events, the owner, operator, or permittee shall:

- (1) for this sampling event, submit written notification as described in subsection (b)(2);
- (2) establish background ground water quality as described in subsection (b)(4) for any constituent that has been detected in ground water samples collected during this sampling event;
- (3) establish a ground water protection standard as described in section 11 of this rule for any constituent that has been detected in ground water samples collected during the sampling event;
- (4) for subsequent sampling events following the sampling event required under this section, include sampling for all constituents listed in subdivision (1); and
- (5) include the sampling event in the assessment monitoring sample event schedule.

(f) During assessment ground water monitoring, the owner, operator, or permittee shall proceed according to the following:

- (1) If the concentration of ~~any~~ **a** constituent listed in section 16 of this rule (Table 2) is determined to be less than or equal to background ground water quality, for two (2) consecutive semiannual sampling events, then the owner, operator, or permittee may request from the commissioner permission to **remove the constituent from the assessment monitoring list. When the concentrations of all constituents listed in section 16 of this rule (Table 2) is determined to be less than or equal to background ground water quality, for two (2) consecutive semiannual sampling events, then the owner, operator, or permittee may request from the commissioner permission to return to a detection monitoring program.**
- (2) If the concentration of any constituent listed in section 16 of this rule (Table 2) is determined to be a statistically significant increase over background ground water quality, but below the ground water protection standard established in section 11 of this rule, then assessment ground water monitoring must continue in accordance with this section.
- (3) If a statistically significant increase above the ground water protection standard is determined for

annual basis, or at an alternate frequency specified by the commissioner. Samples for assessment monitoring must be collected from each **ground water monitoring** well identified in subsection (b)(2)(B). For these sampling events, the owner, operator, or permittee shall:

- (1) ~~for this sampling event~~, submit written notification as described in subsection (b)(2);
- (2) establish background ground water quality as described in subsection (b)(4) for any constituent that has been detected in ground water samples collected during ~~this~~ **each** sampling event;
- (3) establish a ground water protection standard as described in section 11 of this rule for any constituent that has been detected in ground water samples collected during the sampling event;
- (4) for subsequent sampling events following the sampling event required under this section, include sampling for all constituents listed in ~~subdivision (1)~~ **subsection (b)(2)(A); and**
- (5) include the sampling event in the assessment monitoring sample event schedule.

(f) During assessment ground water monitoring, the owner, operator, or permittee shall proceed according to the following:

- (1) If the concentration of ~~any~~ **a** constituent listed in section 16 of this rule (Table 2) is determined to be less than or equal to background ground water quality, for two (2) consecutive semiannual sampling events, then the owner, operator, or permittee may request from the commissioner permission to **remove the constituent from the assessment monitoring list. When the concentrations of all constituents listed in section 16 of this rule (Table 2) are determined to be less than or equal to background ground water quality, for two (2) consecutive semiannual sampling events, then the owner, operator, or permittee may request from the commissioner permission to return to a detection monitoring program.**
- (2) If the concentration of any constituent listed in section 16 of this rule (Table 2) is determined to be a statistically significant increase over background ground water quality, but below the ground water protection standard established in section 11 of this rule, then assessment ground water monitoring must continue in accordance with this section.
- (3) If a statistically significant increase above the ground water protection standard is determined for any constituent listed in section 16 of this rule (Table 2), the owner, operator, or permittee shall perform the following:

any constituent listed in section 16 of this rule (Table 2), the owner, operator, or permittee shall perform the following:

(A) Notify the commissioner within fourteen (14) days of this determination. The notification to the commissioner must include the following information:

- (i) A list of all constituents in section 16 of this rule (Table 2) that have a statistically significant increase above the ground water protection standard established under section 11 of this rule.
- (ii) The identification of each ground water monitoring well from which samples indicated a statistically significant increase.
- (iii) Whether or not the owner, operator, or permittee intends to institute verification procedures and resampling as described under section 8 of this rule.

(B) In the event that a corrective action program is to be implemented, notify all pertinent local officials, including the county commissioner, and officials of the solid waste management district and the county health department.

(C) Within ninety (90) days of a determination under this subdivision, submit to the commissioner an initial proposal for a corrective action program that is designed to meet the requirements of section 13(b) of this rule unless the owner, operator, or permittee chooses to:

- (i) institute a verification resampling program described in section 8 of this rule; or
- (ii) submit a demonstration pursuant to section 9 of this rule.

(D) Remain in an assessment ground water monitoring program, which the commissioner may modify.

(g) During assessment ground water monitoring, whenever the concentration of a secondary constituent identified in section 11(c) of this rule is found to exceed levels that are twice the ground water protection standard, as established in section 11 of this rule, the owner, operator, or permittee shall perform the following:

(1) Notify the commissioner within fourteen (14) days of the finding. This notification must include

(A) Notify the commissioner within fourteen (14) days of this determination. The notification to the commissioner must include the following information:

- (i) A list of all constituents in section 16 of this rule (Table 2) that have a statistically significant increase above the ground water protection standard established under section 11 of this rule.
- (ii) The identification of each ground water monitoring well from which samples indicated a statistically significant increase.
- (iii) Whether or not the owner, operator, or permittee intends to institute verification procedures and resampling as described under section 8 of this rule.

(B) In the event that a corrective action program is to be implemented, notify all pertinent local officials, including the county commissioner, and officials of the solid waste management district and the county health department.

(C) Within ninety (90) days of a determination under this subdivision, submit to the commissioner an initial proposal for a corrective action program that is designed to meet the requirements of section 13(b) of this rule unless the owner, operator, or permittee chooses to:

- (i) institute a verification resampling program described in section 8 of this rule; or
- (ii) submit a demonstration pursuant to section 9 of this rule.

(D) Remain in an assessment ground water monitoring program, which the commissioner may modify.

(g) During assessment ground water monitoring, whenever the concentration of a secondary constituent identified in section 11(c) of this rule is found to exceed levels that are twice the ground water protection standard **at the monitoring boundary**, as established in section 11 of this rule, the owner, operator, or permittee shall perform the following:

(1) Notify the commissioner within fourteen (14) days of the finding. This notification must include the following information:

- (A) The identity and most recent concentration of any secondary constituent found to have the excessive levels.

the following information:

- (A) The identity and most recent concentration of any secondary constituent found to have the excessive levels.
- (B) The identification of each ground water monitoring well found to have excessive levels of a secondary constituent.
- (C) Whether verification resampling, as described under section 8 of this rule, will be initiated.

(2) Submit, if so directed by the commissioner, a proposal for a corrective action program. The proposal must be submitted within ninety (90) days after receiving notification from the commissioner that the proposal is required and must be in accordance with the requirements of section 13(b) of this rule, provided the owner, operator, or permittee:

- (A) does not institute a verification resampling program pursuant to section 8 of this rule; and
- (B) does not choose to submit a demonstration pursuant to section 9 of this rule.

(3) Remain in an assessment ground water monitoring program, which the commissioner may modify.

(h) If it is determined that the MSWLF is the cause of concentrations exceeding the secondary maximum contaminant levels established for chloride, sulfate, and total dissolved solids at the property boundary of the MSWLF, then the owner, operator, or permittee may be required to establish a corrective action program under section 13 of this rule to ensure the elevated concentrations do not go beyond the property boundary.

(B) The identification of each ground water monitoring well found to have excessive levels of a secondary constituent.

(C) Whether verification resampling, as described under section 8 of this rule, will be initiated.

(2) Submit, if so directed by the commissioner, a proposal for a corrective action program. The proposal must be submitted within ninety (90) days after receiving notification from the commissioner that the proposal is required and must be in accordance with the requirements of section 13(b) of this rule, provided the owner, operator, or permittee:

- (A) does not institute a verification resampling program pursuant to section 8 of this rule; and
- (B) does not choose to submit a demonstration pursuant to section 9 of this rule.

(3) Remain in an assessment ground water monitoring program, which the commissioner may modify.

(h) If it is determined that the MSWLF is the cause of concentrations exceeding the secondary maximum contaminant levels established for chloride, sulfate, and total dissolved solids at the real property boundary of the MSWLF, then the owner, operator, or permittee may be required to establish a corrective action program under section 13 of this rule to ensure that the elevated concentrations do not go beyond the real property boundary.

(i) For sampling events during assessment ground water monitoring, the commissioner may require that any of the constituents identified in Table 3 under 329 IAC 10-21-17 be added to the assessment monitoring list based on wastes placed in the MSWLF unit, historical ground water quality, or geologic setting. Any constituent included in sampling from Table 3 must comply with all sections of this rule regarding statistical evaluation, establishment and exceedance of the ground water protection standards.

329 IAC 10-21-13 Corrective action program

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 13. (a) The owner, operator, or permittee must submit a proposal for a plume and site characterization plan, as described in subsection (b), and initiate an assessment of various corrective measures, as described in subsection (d), within ninety (90) days of determining any of the following:

- (1) A statistically significant increase above any ground water protection standard, as identified in section 11(a) or 11(b) of this rule, has occurred during an assessment ground water monitoring program for any constituent that is listed in section 16 of this rule (Table 2).
- (2) At the request of the commissioner, and during assessment monitoring, a secondary constituent listed under section 11(c) of this rule has exceeded levels that are twice the ground water protection standard for that constituent.
- (3) At the request of the commissioner, and during detection monitoring, a constituent listed in section 15(a) of this rule (Table 1A) has shown a concentration that is a statistically significant increase over a ground water protection standard established during a previous assessment monitoring program. Previous monitoring programs include those programs conducted under section 10 of this rule, or Phase II programs conducted under 329 IAC 2-16, which was repealed in 1996.

(b) The proposal for a plume and site characterization plan must include the following:

- (1) Characterization of the chemical and physical nature of the contaminants, including vertical and horizontal extent of the release by:
 - (A) proposing location and installation procedures for additional assessment ground water monitoring wells, as necessary; and
 - (B) identification of all constituents to be analyzed during subsequent ground water sampling events.
- (2) Characterization of the contaminated aquifer, limited to the area of the contamination plume. Aquifer characterization may include all of the items described in this subsection.
- (3) Proposed location and installation procedures of at least one (1) additional ground water monitoring well at the facility boundary in the direction of contaminant migration.
- (4) The process by which all persons who own or reside on land that directly overlies any part of the

329 IAC 10-21-13 Corrective action program

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 13. (a) The owner, operator, or permittee must submit a proposal for a plume and site characterization plan, as described in subsection (b), and initiate an assessment of various corrective measures, as described in subsection (d), within ninety (90) days of determining any of the following:

- (1) A statistically significant increase above any ground water protection standard, as identified in section 11(a) or 11(b) of this rule, has occurred during an assessment ground water monitoring program for any constituent that is listed in section 16 of this rule (Table 2).
- (2) At the request of the commissioner, and during assessment monitoring, a secondary constituent listed under section 11(c) of this rule has exceeded levels that are twice the ground water protection standard for that constituent.
- (3) At the request of the commissioner, and during detection monitoring, a constituent listed in section 15(a) of this rule (Table 1A) has shown a concentration that is a statistically significant increase over a ground water protection standard established during a previous assessment monitoring program. Previous monitoring programs include those programs conducted under section 10 of this rule, or Phase II programs conducted under 329 IAC 2-16, which was repealed in 1996.

(b) The proposal for a plume and site characterization plan must include the following:

- (1) Characterization of the chemical and physical nature of the contaminants, including vertical and horizontal extent of the release by:
 - (A) proposing location and installation procedures for additional assessment ground water monitoring wells, as necessary; and
 - (B) identification of all constituents to be analyzed during subsequent ground water sampling events.
- (2) Characterization of the contaminated aquifer, limited to the area of the contamination plume. Aquifer characterization may include all of the items described in this subsection.
- (3) Proposed location and installation procedures of at least one (1) additional ground water monitoring well at the facility boundary in the direction of contaminant migration.
- (4) The process by which all persons who own or reside on land that directly overlies any part of the contaminated ground water plume will be notified.

contaminated ground water plume will be notified.

(5) The process for sampling and analyzing ground water at any private or public intake, as specified by the commissioner, unless permission to sample cannot be obtained from the owner of the intake.

(6) The process by which drinking water will be supplied to all public and private ground water intakes affected by the contamination.

(7) Procedures that will be implemented to stop further migration of contaminants.

(c) Implementation of the plume and site characterization plan must include the following:

(1) Within thirty (30) days of receiving written approval of the initial corrective action proposal, the owner, operator, or permittee shall implement subsection (b)(1) through (b)(7).

(2) The owner, operator, or permittee shall submit a corrective action progress report, including any sampling and analysis results, on a semiannual basis, until the contamination has been determined to be cleaned up as defined in subsection (j).

(3) The ground water monitoring well identified in subsection (b)(3) must be sampled in accordance with section 10(b) and 10(d) of this rule.

(4) If any additional constituent is detected in the **ground water** monitoring well identified in subsection (b)(3) and that constituent exceeds its ground water protection standard at a statistically significant concentration, then the owner, operator, or permittee shall include that constituent in the sampling of the ground water monitoring wells identified in subsection (b)(1).

(5) The owner, operator, or permittee shall gather sufficient information from the plume and site characterization plan to be presented at the public meeting required in section 12 of this rule and incorporated in the final decision on an corrective action remedy as described in subsection (e).

(d) The assessment of various corrective measures must be initiated within ninety (90) days of determining that a corrective action program is necessary. The owner, operator, or permittee shall complete the assessment of various corrective measures in a reasonable time, with the approval of the commissioner, and in accordance with the following:

(1) The assessment of various corrective measures must include an analysis of the effectiveness of potential corrective measures in meeting all of the remedy requirements and objectives as described in subsection (e).

(2) The analysis must include the following:

(5) The process for sampling and analyzing ground water at any private or public intake, as specified by the commissioner, unless permission to sample cannot be obtained from the owner of the intake.

(6) The process by which drinking water will be supplied to all public and private ground water intakes affected by the contamination.

(7) Procedures that will be implemented to stop further migration of contaminants.

(c) Implementation of the plume and site characterization plan must include the following:

(1) Within thirty (30) days of receiving written approval of the initial corrective action proposal, the owner, operator, or permittee shall implement subsection (b)(1) through (b)(7).

(2) The owner, operator, or permittee shall submit a corrective action progress report, including any sampling and analysis results, on a semiannual basis, until the contamination has been determined to be cleaned up as defined in subsection (j).

(3) The ground water monitoring well identified in subsection (b)(3) must be sampled in accordance with section 10(b) and 10(d) of this rule.

(4) If any additional constituent is detected in the **ground water** monitoring well identified in subsection (b)(3) and that constituent exceeds its ground water protection standard at a statistically significant concentration, then the owner, operator, or permittee shall include that constituent in the sampling of the ground water monitoring wells identified in subsection (b)(1).

(5) The owner, operator, or permittee shall gather sufficient information from the plume and site characterization plan to be presented at the public meeting required in section 12 of this rule and incorporated in the final decision on an corrective action remedy as described in subsection (e).

(d) The assessment of various corrective measures must be initiated within ninety (90) days of determining that a corrective action program is necessary. The owner, operator, or permittee shall complete the assessment of various corrective measures in a reasonable time, with the approval of the commissioner, and in accordance with the following:

(1) The assessment of various corrective measures must include an analysis of the effectiveness of potential corrective measures in meeting all of the remedy requirements and objectives as described in subsection (e).

(2) The analysis must include the following:

(A) The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies. This shall include safety impacts, cross-media impacts, and control of exposure to any residual contamination.

(B) The time required to begin and complete the remedy.

(C) Implementation costs of the proposed remedy.

(D) The institutional requirements, such as state or local permit requirements, or other environmental or public health requirements that may substantially affect remedy implementation.

(E) A discussion by the owner, operator, or permittee of the corrective measures assessment, prior to the selection of a remedy, in a public meeting as required in section 12 of this rule.

(3) The owner, operator, or permittee shall continue to monitor in accordance with the assessment ground water monitoring program as required in section 10 of this rule.

(e) The selection of the corrective action remedy must be based on the assessment of various corrective measures conducted under subsection (d), including the following:

(1) The owner, operator, or permittee shall:

(A) select a remedy that, at a minimum, meets the standards listed in subdivision (2); and

(B) submit to the commissioner, within sixty (60) days after the public meeting required in section 12 of this rule, a report describing the selected remedy and how the remedy meets the standards of subdivision (2).

(2) The owner, operator, or permittee shall select a remedy that:

(A) will be protective of human health ~~and~~ or the environment;

(B) will attain the ground water protection standard as required in section 11 of this rule;

(C) will reduce or eliminate, to the maximum extent practicable, further releases of those constituents in sections 15 and 16 of this rule (Table 1A, Table 1B, and Table 2), and in section 11(c) of this rule that may pose a threat to human health or the environment;

(D) will comply with standards for waste management as required in subsection (i);

(A) The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies. This shall include safety impacts, cross-media impacts, and control of exposure to any residual contamination.

(B) The time required to begin and complete the remedy.

(C) Implementation costs of the proposed remedy.

(D) The institutional requirements, such as state or local permit requirements, or other environmental or public health requirements that may substantially affect remedy implementation.

(E) A discussion by the owner, operator, or permittee of the corrective measures assessment, prior to the selection of a remedy, in a public meeting as required in section 12 of this rule.

(3) The owner, operator, or permittee shall continue to monitor in accordance with the assessment ground water monitoring program as required in section 10 of this rule.

(e) The selection of the corrective action remedy must be based on the assessment of various corrective measures conducted under subsection (d), including the following:

(1) The owner, operator, or permittee shall:

(A) select a remedy that, at a minimum, meets the standards listed in subdivision (2); and

(B) submit to the commissioner, within sixty (60) days after the public meeting required in section 12 of this rule, a report describing the selected remedy and how the remedy meets the standards of subdivision (2).

(2) The owner, operator, or permittee shall select a remedy that:

(A) will be protective of human health and the environment;

(B) will attain the ground water protection standard as required in section 11 of this rule;

(C) will reduce or eliminate, to the maximum extent practicable, further releases of those constituents in sections 15 and 16 of this rule (Table 1A, Table 1B, and Table 2), and in section 11(c) of this rule that may pose a threat to human health or the environment;

(D) will comply with standards for waste management as required in subsection (i); and

and

(E) is chosen after considering input from the public hearing required under section 12 of this rule.

(3) In selecting a remedy that meets the standards of subdivision (2), a report must be submitted that includes the following factors:

(A) The long and short term effectiveness and protection that is offered by the potential remedy, along with an assessment of the remedy's probable outcome, based on the following considerations:

- (i) The magnitude of reduction in the existing risks.
- (ii) The magnitude of residual risks in terms of likelihood of further releases, due to waste remaining after implementing a remedy.
- (iii) The type and degree of long term management required, including monitoring, operation, and maintenance.
- (iv) The short term risks that might be posed to the community, workers, or the environment during the implementation of such a remedy. Short term risk assessment shall include potential threats to human health ~~and~~ **or** the environment associated with excavation, transportation, redisposal, or containment of waste or contaminated materials.
- (v) The estimated time until corrective measures are completed.
- (vi) The potential for exposure of humans and environmental receptors to remaining waste, including the potential threat associated with excavation, transportation, redisposal, or containment of waste or contaminated materials.
- (vii) The long term reliability of the engineering and institutional controls.
- (viii) The potential need for additional or alternative remedies.

(B) The effectiveness of the remedy in controlling the source and in reducing further releases based on the following considerations:

- (i) The extent to which containment practices will reduce further releases.
- (ii) The extent to which treatment technologies may be used to reduce

(E) is chosen after considering input from the public hearing required under section 12 of this rule.

(3) In selecting a remedy that meets the standards of subdivision (2), a report must be submitted that includes the following factors:

(A) The long and short term effectiveness and protection that is offered by the potential remedy, along with an assessment of the remedy's probable outcome, based on the following considerations:

- (i) The magnitude of reduction in the existing risks.
- (ii) The magnitude of residual risks in terms of likelihood of further releases, due to waste remaining after implementing a remedy.
- (iii) The type and degree of long term management required, including monitoring, operation, and maintenance.
- (iv) The short term risks that might be posed to the community, workers, or the environment during the implementation of such a remedy. Short term risk assessment shall include potential threats to human health ~~and~~ **or** the environment associated with excavation, transportation, redisposal, or containment of waste or contaminated materials.
- (v) The estimated time until corrective measures are completed.
- (vi) The potential for exposure of humans and environmental receptors to remaining waste, including the potential threat associated with excavation, transportation, redisposal, or containment of waste or contaminated materials.
- (vii) The long term reliability of the engineering and institutional controls.
- (viii) The potential need for additional or alternative remedies.

(B) The effectiveness of the remedy in controlling the source and in reducing further releases based on the following considerations:

- (i) The extent to which containment practices will reduce further releases.
- (ii) The extent to which treatment technologies may be used to reduce further releases.

(C) The ease or difficulty of implementing a potential remedy based on the following considerations:

- further releases.
- (C) The ease or difficulty of implementing a potential remedy based on the following considerations:
- (i) The technical difficulty of constructing the proposed remedy.
 - (ii) The expected operational reliability of the proposed remedial technologies.
 - (iii) The need to coordinate with and obtain necessary approvals and permits from other local or state agencies.
 - (iv) The availability of necessary equipment and specialists.
 - (v) The available capacity and location of needed treatment, storage, and disposal facilities.
- (D) The capability of the owner, operator, or permittee to manage the technical and economic aspects of the corrective measures.
- (E) The degree to which community concerns are addressed by a potential remedy.
- (4) The selected remedy report, as described in subdivision (1)(B), must include a schedule for initiating and completing remedial activities. This schedule must be based on the following considerations:
- (A) Vertical and horizontal extent, and physical or chemical characteristics of contamination.
 - (B) Direction of contaminant movement.
 - (C) Capacity of remedial technologies to achieve compliance with ground water protection standards, as established under section 11 of this rule, and any other remedial objectives.
 - (D) Availability of treatment or disposal capacity for waste volumes managed during implementation of remedial measures.
 - (E) Practical considerations of proposing to use currently unavailable technology that may offer significant advantages over readily available technology, in terms of effectiveness, reliability, safety, or ability to achieve remedial objectives.
 - (F) Potential risks to human health **and or** the environment from exposure to contamination prior to completing remedial measures.
 - (G) Resource value of the zone of saturation or aquifer, including the following:
 - (i) Current and future uses.
 - (ii) Proximity and withdrawal rate of

- (i) The technical difficulty of constructing the proposed remedy.
 - (ii) The expected operational reliability of the proposed remedial technologies.
 - (iii) The need to coordinate with and obtain necessary approvals and permits from other local or state agencies.
 - (iv) The availability of necessary equipment and specialists.
 - (v) The available capacity and location of needed treatment, storage, and disposal facilities.
- (D) The capability of the owner, operator, or permittee to manage the technical and economic aspects of the corrective measures.
- (E) The degree to which community concerns are addressed by a potential remedy.
- (4) The selected remedy report, as described in subdivision (1)(B), must include a schedule for initiating and completing remedial activities. This schedule must be based on the following considerations:
- (A) Vertical and horizontal extent, and physical or chemical characteristics of contamination.
 - (B) Direction of contaminant movement.
 - (C) Capacity of remedial technologies to achieve compliance with ground water protection standards, as established under section 11 of this rule, and any other remedial objectives.
 - (D) Availability of treatment or disposal capacity for waste volumes managed during implementation of remedial measures.
 - (E) Practical considerations of proposing to use currently unavailable technology that may offer significant advantages over readily available technology, in terms of effectiveness, reliability, safety, or ability to achieve remedial objectives.
 - (F) Potential risks to human health **and or** the environment from exposure to contamination prior to completing remedial measures.
 - (G) Resource value of the zone of saturation or aquifer, including the following:
 - (i) Current and future uses.
 - (ii) Proximity and withdrawal rate of users.
 - (iii) Ground water quantity and quality.
 - (iv) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.
 - (v) The hydrogeologic characteristics of the MSWLF and surrounding land.

users.

- (iii) Ground water quantity and quality.
- (iv) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.
- (v) The hydrogeologic characteristics of the MSWLF and surrounding land.
- (vi) Ground water removal and treatment costs.
- (vii) The cost and availability of alternative water supplies.

(H) Practical capability of the owner, operator, or permittee to achieve the remedy.

(I) Other relevant factors that may be determined by the commissioner.

(5) Selection of a remedy and implementation schedule must be submitted to the commissioner for review and approval.

(6) The commissioner may determine that remediation of a released constituent, listed in either section 16 of this rule (Table 2) or in section 11(c) of this rule, is not necessary if either of the following are demonstrated to the satisfaction of the commissioner:

- (A) Remediation is technically impracticable.
- (B) Remediation would result in unacceptable cross-media impacts.

(7) If the commissioner determines that an aquifer cannot be remediated, the owner, operator, or permittee shall contain the aquifer to prevent the migration of contaminants.

(8) A determination made by the commissioner under subdivision (6) will not affect the authority of the state to require source control measures or other necessary measures to:

- (A) eliminate or minimize further releases to the ground water;
- (B) prevent exposure to the ground water; or
- (C) remediate ground water quality to technically achievable concentrations and significantly reduce threats to human health or the environment.

(f) Based on the schedule established under subsection (e)(4) and approved by the commissioner under subsection (e)(5), the owner, operator, or permittee shall do the following:

- (1) Establish and implement a corrective action ground water monitoring program that:
 - (A) at a minimum, meets the requirements of an assessment monitoring program under section 10 of this rule;

- (vi) Ground water removal and treatment costs.
- (vii) The cost and availability of alternative water supplies.

(H) Practical capability of the owner, operator, or permittee to achieve the remedy.

(I) Other relevant factors that may be determined by the commissioner.

(5) Selection of a remedy and implementation schedule must be submitted to the commissioner for review and approval.

(6) The commissioner may determine that remediation of a released constituent, listed in either section 16 of this rule (Table 2) or in section 11(c) of this rule, is not necessary if either of the following are demonstrated to the satisfaction of the commissioner:

- (A) Remediation is technically impracticable.
- (B) Remediation would result in unacceptable cross-media impacts.

(7) If the commissioner determines that an aquifer cannot be remediated, the owner, operator, or permittee shall contain the aquifer to prevent the migration of contaminants.

(8) A determination made by the commissioner under subdivision (6) will not affect the authority of the state to require source control measures or other necessary measures to:

- (A) eliminate or minimize further releases to the ground water;
- (B) prevent exposure to the ground water; or
- (C) remediate ground water quality to technically achievable concentrations and significantly reduce threats to human health or the environment.

(f) Based on the schedule established under subsection (e)(4) and approved by the commissioner under subsection (e)(5), the owner, operator, or permittee shall do the following:

- (1) Establish and implement a corrective action ground water monitoring program that:
 - (A) at a minimum, meets the requirements of an assessment monitoring program under section 10 of this rule;
 - (B) indicates the effectiveness of the corrective action remedy; and
 - (C) demonstrates compliance with the ground water protection standard under subsection (j).
- (2) Implement the corrective action remedy selected under subsection (e).
- (3) Take any interim measures necessary to ensure the protection of human health and the environment.

(B) indicates the effectiveness of the corrective action remedy; and
(C) demonstrates compliance with the ground water protection standard under subsection (j).

(2) Implement the corrective action remedy selected under subsection (e).

(3) Take any interim measures necessary to ensure the protection of human health **and or** the environment. Interim measures must, to the greatest extent practicable, be consistent with remedial objectives and, if possible, contribute to the performance of remedial measures. The following factors must be considered in determining whether interim measures are necessary:

(A) Time required to develop and implement a final remedy.

(B) Actual and potential exposure of nearby populations or environmental receptors to regulated constituents.

(C) Actual and potential contamination of potentially useable water supplies or sensitive ecosystems.

(D) Further degradation of the ground water that may occur if remedial action is not initiated expeditiously.

(E) Weather conditions that may cause regulated constituents to migrate or be released.

(F) Potential for:

(i) fire or explosion; or

(ii) exposure to regulated constituents as a result of an accident, a container failure, or a handling system failure.

(G) Other situations that may pose threats to human health **and or** the environment.

(4) Submit a report to the commissioner detailing the progress and performance of the selected remedy. The report must be submitted on a semiannual basis or as determined by the commissioner.

(g) An owner, operator, or permittee or the commissioner may determine, based on information developed after implementation of the remedy has begun or on other information, that compliance under subsection (e)(2) is not being achieved through the remedy selected. In such cases, after approval by the commissioner, the owner, operator, or permittee shall implement other methods or techniques that could practicably achieve compliance with the requirements unless the owner, operator, or permittee makes a

Interim measures must, to the greatest extent practicable, be consistent with remedial objectives and, if possible, contribute to the performance of remedial measures. The following factors must be considered in determining whether interim measures are necessary:

(A) Time required to develop and implement a final remedy.

(B) Actual and potential exposure of nearby populations or environmental receptors to regulated constituents.

(C) Actual and potential contamination of potentially useable water supplies or sensitive ecosystems.

(D) Further degradation of the ground water that may occur if remedial action is not initiated expeditiously.

(E) Weather conditions that may cause regulated constituents to migrate or be released.

(F) Potential for:

(i) fire or explosion; or

(ii) exposure to regulated constituents as a result of an accident, a container failure, or a handling system failure.

(G) Other situations that may pose threats to human health **and or** the environment.

(4) Submit a report to the commissioner detailing the progress and performance of the selected remedy. The report must be submitted on a semiannual basis or as determined by the commissioner.

(g) An owner, operator, or permittee or the commissioner may determine, based on information developed after implementation of the remedy has begun or on other information, that compliance under subsection (e)(2) is not being achieved through the remedy selected. In such cases, after approval by the commissioner, the owner, operator, or permittee shall implement other methods or techniques that could practicably achieve compliance with the requirements unless the owner, operator, or permittee makes a determination under subsection (h).

(h) If the owner, operator, or permittee determines that compliance with requirements under subsection (e)(2) cannot be technically achieved with any currently available methods, the owner, operator, or permittee shall:

(1) apply for a commissioner's certification that compliance with requirements under subsection (e)(2) cannot be achieved with any currently available methods;

determination under subsection (h).

(h) If the owner, operator, or permittee determines that compliance with requirements under subsection (e)(2) cannot be technically achieved with any currently available methods, the owner, operator, or permittee shall:

- (1) apply for a commissioner's certification that compliance with requirements under subsection (e)(2) cannot be achieved with any currently available methods;
- (2) implement alternate measures to contain contamination, as necessary, to protect human health, the environment and water resources;
- (3) implement alternate measures that are technically practicable and consistent with the overall remedial objective to:
 - (A) control contamination sources; and
 - (B) remove or decontaminate equipment, units, devices, or structure; and
- (4) within fourteen (14) days of determining that compliance cannot be achieved under subsection (g), submit a report to the commissioner that justifies the alternative measures. The report must be approved by the commissioner prior to implementation of any alternative measures.

(i) During a corrective action program, all solid waste managed under a remedy that is required under subsection (e), or under an interim measure that is required under subsection (f)(3), must be managed in a manner that:

- (1) is protective of human health ~~and or~~ the environment; and
- (2) complies with the applicable requirements of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901 et seq., as amended by the Hazardous and Solid Waste Amendments of 1984.

(j) Remedies selected under subsection (e) are considered complete when the owner, operator, or permittee has demonstrated to the satisfaction of the commissioner the following:

- (1) Ground water protection standards have been met at all points within the plume of contamination.
- (2) For a period of three (3) consecutive years, using statistical procedures and performance standards outlined in section 6 of this rule, the following ground water protection standard, whichever is applicable, has not been exceeded:
 - (A) The ground water protection standards

- (2) implement alternate measures to contain contamination, as necessary, to protect human health, the environment and water resources;
- (3) implement alternate measures that are technically practicable and consistent with the overall remedial objective to:

- (A) control contamination sources; and
 - (B) remove or decontaminate equipment, units, devices, or structure; and

- (4) within fourteen (14) days of determining that compliance cannot be achieved under subsection (g), submit a report to the commissioner that justifies the alternative measures. The report must be approved by the commissioner prior to implementation of any alternative measures.

(i) During a corrective action program, all solid waste managed under a remedy that is required under subsection (e), or under an interim measure that is required under subsection (f)(3), must be managed in a manner that:

- (1) is protective of human health and the environment; and
- (2) complies with the applicable requirements of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901 et seq., as amended by the Hazardous and Solid Waste Amendments of 1984.

(j) Remedies selected under subsection (e) are considered complete when the owner, operator, or permittee has demonstrated to the satisfaction of the commissioner the following:

- (1) Ground water protection standards have been met at all points within the plume of contamination.
- (2) For a period of three (3) consecutive years, using statistical procedures and performance standards outlined in section 6 of this rule, the following ground water protection standard, whichever is applicable, has not been exceeded:

(A) The ground water protection standards for the constituents listed in section 16 of this rule (Table 2).

(B) Levels that are twice the concentration of any secondary constituent identified in section 11(c) of this rule.

- (3) All corrective actions required to complete the remedy have been satisfied.

(k) The commissioner may, after considering the factors indicated in subsection (l), specify an alternate period during which the following demonstration, whichever is applicable, must be made:

for the constituents listed in section 16 of this rule (Table 2).

(B) Levels that are twice the concentration of any secondary constituent identified in section 11(c) of this rule.

(3) All corrective actions required to complete the remedy have been satisfied.

(k) The commissioner may, after considering the factors indicated in subsection (l), specify an alternate period during which the following demonstration, whichever is applicable, must be made:

(1) The concentrations of the constituents listed in section 16 of this rule (Table 2) have not exceeded ground water protection standards.

(2) The concentrations of constituents listed in section 11(c) of this rule have not exceeded levels that are twice the ground water protection standard.

(l) The following factors will be considered by the commissioner in specifying an alternative time period:

(1) Vertical and horizontal extent and concentration of the release.

(2) Physical and chemical characteristics of the regulated constituents within the ground water.

(3) Accuracy of the ground water monitoring or modeling techniques, including any seasonal, meteorological, or other environmental variabilities that may affect the accuracy.

(4) Physical and chemical characteristics of the affected ground water.

(5) Physical and chemical characteristics of the affected or potentially affected aquifer system.

(m) Within fourteen (14) days after the completion of all remedial measures, a certification report, signed by the owner, operator, or permittee and a qualified ground water scientist, shall be submitted to the commissioner for written approval. The report must certify that the remedy has been completed in compliance with the requirements of subsection (j).

(n) Upon receipt of the commissioner's written approval of the certification report specified in subsection (m), the owner, operator, or permittee shall be released from the requirements for financial assurance for corrective action specified in 329 IAC 10-39-10.

(o) Corrective action programs that have been initiated under 329 IAC 1.5, which was repealed in 1989, or under 329 IAC 2, which was repealed in

(1) The concentrations of the constituents listed in section 16 of this rule (Table 2) have not exceeded ground water protection standards.

(2) The concentrations of constituents listed in section 11(c) of this rule have not exceeded levels that are twice the ground water protection standard.

(l) The following factors will be considered by the commissioner in specifying an alternative time period:

(1) Vertical and horizontal extent and concentration of the release.

(2) Physical and chemical characteristics of the regulated constituents within the ground water.

(3) Accuracy of the ground water monitoring or modeling techniques, including any seasonal, meteorological, or other environmental variabilities that may affect the accuracy.

(4) Physical and chemical characteristics of the affected ground water.

(5) Physical and chemical characteristics of the affected or potentially affected aquifer system.

(m) Within fourteen (14) days after the completion of all remedial measures, a certification report, signed by the owner, operator, or permittee and a qualified ground water scientist, shall be submitted to the commissioner for written approval. The report must certify that the remedy has been completed in compliance with the requirements of subsection (j).

(n) Upon receipt of the commissioner's written approval of the certification report specified in subsection (m), the owner, operator, or permittee shall be released from the requirements for financial assurance for corrective action specified in 329 IAC 10-39-10.

(o) Corrective action programs that have been initiated under 329 IAC 1.5, which was repealed in 1989, or under 329 IAC 2, which was repealed in 1996, must continue as approved by the commissioner, and the commissioner may incorporate requirements **found** under this rule.

1996, must continue as approved by the commissioner, and the commissioner may incorporate requirements found under this rule.

329 IAC 10-21-15 Constituents for detection monitoring

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 15. (a) The following constituents shall be measured during detection monitoring and be subject to statistical evaluation procedures under section 6 of this rule:

TABLE 1A
Constituents for Detection Monitoring Subject to
Statistical Evaluation Procedures

Common Name ¹	CAS RN ²
(1) Ammonia (as N)	
(2) Benzene	71-43-2
(3) Cadmium	(Dissolved)
(4) Carbon tetrachloride	56-23-5
(5) Chloride	
(6) Chlorobenzene	108-90-7
(7) Chloroethane; Ethyl chloride	75-00-3
(8) Chloroform; Trichloromethane	67-66-3
(9) Chromium	(Dissolved)
(10) Copper	(Dissolved)
(11) o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1
(12) p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7
(13) 1,1-Dichloroethane; Ethylidene chloride	75-34-3
(14) 1,2-Dichloroethane; Ethylene dichloride	107-06-2
(15) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride	75-35-4
(16) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2
(17) trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene	156-60-5
(18) 1,2-Dichloropropane; Propylene dichloride	78-87-5
(19) cis-1,3-Dichloropropene	10061-01-5
(20) trans-1,3-Dichloropropene	10061-02-6
(21) Ethylbenzene	100-41-4
(22) Methyl bromide; Bromomethane	74-83-9
(23) Methyl chloride; Chloromethane	74-87-3
(24) Methylene chloride; Dichloromethane	75-09-2
(25) Styrene	100-42-5
(26) Sodium	(Dissolved)
(27) Sulfate	
(28) 1,1,1,2-Tetrachloroethane	630-20-6
(29) 1,1,2,2-Tetrachloroethane	79-34-5
(30) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	127-18-4
(31) Toluene	108-88-3
(32) 1,1,1-Trichloroethane; Methylchloroform	71-55-6
(33) 1,1,2-Trichloroethane	79-00-5
(34) Trichloroethylene; Trichloroethene	79-01-6
(35) Trichlorofluoromethane; CFC-11	75-69-4
(36) Vinyl chloride; Chloroethene	75-01-4
(37) Xylene (Total)	See note 3
(38) Zinc	(Dissolved)
Inorganics:	
(1) Ammonia (as N)	
(2) Cadmium	(Dissolved)
(3) Chloride	
(4) Chromium	(Dissolved)
(5) Copper	(Dissolved)
(6) Sodium	(Dissolved)
(7) Sulfate	
Volatile organic compounds:	
(9) Benzene	71-43-2
(10) Carbon tetrachloride	56-23-5
(11) Chlorobenzene	108-90-7
(12) Chloroethane; Ethyl chloride	75-00-3
(13) Chloroform; Trichloromethane	67-66-3
(14) o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1
(15) p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7

329 IAC 10-21-15 Constituents for detection monitoring

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 15. (a) The following constituents shall be measured during detection monitoring and be subject to statistical evaluation procedures under section 6 of this rule:

TABLE 1A
Constituents for Detection Monitoring Subject to
Statistical Evaluation Procedures

Common Name ¹	CAS RN ²
(1) Ammonia (as N)	
(2) Benzene	71-43-2
(3) Cadmium	(Dissolved)
(4) Carbon tetrachloride	56-23-5
(5) Chloride	
(6) Chlorobenzene	108-90-7
(7) Chloroethane; Ethyl chloride	75-00-3
(8) Chloroform; Trichloromethane	67-66-3
(9) Chromium	(Dissolved)
(10) Copper	(Dissolved)
(11) o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1
(12) p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7
(13) 1,1-Dichloroethane; Ethylidene chloride	75-34-3
(14) 1,2-Dichloroethane; Ethylene dichloride	107-06-2
(15) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride	75-35-4
(16) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2
(17) trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene	156-60-5
(18) 1,2-Dichloropropane; Propylene dichloride	78-87-5
(19) cis-1,3-Dichloropropene	10061-01-5
(20) trans-1,3-Dichloropropene	10061-02-6
(21) Ethylbenzene	100-41-4
(22) Methyl bromide; Bromomethane	74-83-9
(23) Methyl chloride; Chloromethane	74-87-3
(24) Methylene chloride; Dichloromethane	75-09-2
(25) Styrene	100-42-5
(26) Sodium	(Dissolved)
(27) Sulfate	
(28) 1,1,1,2-Tetrachloroethane	630-20-6
(29) 1,1,2,2-Tetrachloroethane	79-34-5
(30) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	127-18-4
(31) Toluene	108-88-3
(32) 1,1,1-Trichloroethane; Methylchloroform	71-55-6
(33) 1,1,2-Trichloroethane	79-00-5
(34) Trichloroethylene; Trichloroethene	79-01-6
(35) Trichlorofluoromethane; CFC-11	75-69-4
(36) Vinyl chloride; Chloroethene	75-01-4
(37) Xylene (Total)	See note 3
(38) Zinc	(Dissolved)
Inorganics:	
(1) Ammonia (as N)	
(2) Cadmium	(Dissolved)
(3) Chloride	
(4) Chromium	(Dissolved)
(5) Copper	(Dissolved)
(6) Sodium	(Dissolved)
(7) Sulfate	
Volatile organic compounds:	
(8) Benzene	71-43-2
(9) Carbon tetrachloride	56-23-5
(10) Chlorobenzene	108-90-7
(11) Chloroethane; Ethyl chloride	75-00-3
(12) Chloroform; Trichloromethane	67-66-3
(13) o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1
(14) p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7

(16) 1,1-Dichloroethane; Ethylidene chloride	75-34-3
(17) 1,2-Dichloroethane; Ethylene dichloride	107-06-2
(18) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride ..	75-35-4
(19) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2
(20) trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene	156-60-5
(21) 1,2-Dichloropropane; Propylene dichloride	78-87-5
(22) cis-1,3-Dichloropropene	10061-01-5
(23) trans-1,3-Dichloropropene	10061-02-6
(24) Ethylbenzene	100-41-4
(25) Methyl bromide; Bromomethane	74-83-9
(26) Methyl chloride; Chloromethane	74-87-3
(27) Methylene chloride; Dichloromethane	75-09-2
(28) Styrene	100-42-5
(29) 1,1,1,2-Tetrachloroethane	630-20-6
(30) 1,1,2,2-Tetrachloroethane	79-34-5
(31) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene ..	127-18-4
(32) Toluene	108-88-3
(33) 1,1,1-Trichloroethane; Methylchloroform	71-55-6
(34) 1,1,2-Trichloroethane	79-00-5
(35) Trichloroethylene; Trichloroethene	79-01-6
(36) Trichlorofluoromethane; CFC-11	75-69-4
(37) Vinyl chloride; Chloroethene	75-01-4
(38) Xylene (Total)	See note 3

(b) The following constituents shall be measured during detection monitoring but are exempt from statistical evaluation procedures under section 6 of this rule:

TABLE 1B
Constituents for Detection Monitoring Not Subject to
Statistical Evaluation Procedures

(1) Field pH	
(2) Field specific conductance	
(3) Field Eh (Oxidation-Reduction Potential)	
(4) Field dissolved oxygen	
(5) Total solids	
(6) Total dissolved solids	
(7) Alkalinity	
(8) Arsenic	(Dissolved)
(9) (9) Bicarbonate	
(10) (10) Calcium	(Dissolved)
(11) (11) Carbonate	
(12) (12) Iron	(Dissolved)
(13) (13) Magnesium	(Dissolved)
(14) (14) Manganese	(Dissolved)
(15) (15) Potassium	(Dissolved)

Notes:

¹Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

²Chemical Abstracts Service registry number. Where “(Dissolved)” is entered, all species in a filtered sample of the ground water that contain this element are included.

³Xylene (total). This entry includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1130-20-7).

(15) 1,1-Dichloroethane; Ethylidene chloride	75-34-3
(16) 1,2-Dichloroethane; Ethylene dichloride	107-06-2
(17) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride ..	75-35-4
(18) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2
(19) trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene	156-60-5
(20) 1,2-Dichloropropane; Propylene dichloride	78-87-5
(21) cis-1,3-Dichloropropene	10061-01-5
(22) trans-1,3-Dichloropropene	10061-02-6
(23) Ethylbenzene	100-41-4
(24) Methyl bromide; Bromomethane	74-83-9
(25) Methyl chloride; Chloromethane	74-87-3
(26) Methylene chloride; Dichloromethane	75-09-2
(27) Styrene	100-42-5
(28) 1,1,1,2-Tetrachloroethane	630-20-6
(29) 1,1,2,2-Tetrachloroethane	79-34-5
(30) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene ..	127-18-4
(31) Toluene	108-88-3
(32) 1,1,1-Trichloroethane; Methylchloroform	71-55-6
(33) 1,1,2-Trichloroethane	79-00-5
(34) Trichloroethylene; Trichloroethene	79-01-6
(35) Trichlorofluoromethane; CFC-11	75-69-4
(36) Vinyl chloride; Chloroethene	75-01-4
(37) Xylene (Total)	See note 3

(b) The following constituents shall be measured during detection monitoring but are exempt from statistical evaluation procedures under section 6 of this rule:

TABLE 1B
Constituents for Detection Monitoring Not Subject to
Statistical Evaluation Procedures

(1) Field pH	
(2) Field specific conductance	
(3) Field Eh (Oxidation-Reduction Potential)	
(4) Field dissolved oxygen	
(5) Total solids	
(6) Total dissolved solids	
(7) Alkalinity	
(8) Arsenic	(Dissolved)
(9) (9) Bicarbonate	
(10) (10) Calcium	(Dissolved)
(11) (11) Carbonate	
(12) (12) Iron	(Dissolved)
(13) (13) Magnesium	(Dissolved)
(14) (14) Manganese	(Dissolved)
(15) (15) Potassium	(Dissolved)

Notes:

¹Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

²Chemical Abstracts Service registry number. Where “(Dissolved)” is entered, all species in a filtered sample of the ground water that contain this element are included.

³Xylene (total). This entry includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1130-20-7).

329 IAC 10-21-16 Constituents for assessment monitoring

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 16. (a) The following constituents in this section shall be subject to assessment monitoring procedures under section 10 of this rule.

TABLE 2

Constituents for Assessment Monitoring	
Common Name ¹	CAS RN ²
Acenaphthylene	208-96-8
Acenaphthene	83-32-9
Acetone	67-64-1
Acetonitrile; Methyl cyanide	75-05-8
Acetophenone	98-86-2
2-Acetylaminofluorene; 2-AAF	53-96-3
Acrolein	107-02-8
Acrylonitrile	107-13-1
Aldrin	309-00-2
Allyl chloride	107-05-1
4-Aminobiphenyl	92-67-1
Anthracene	120-12-7
Antimony	(Total)
Antimony	(Dissolved)
Arsenic	(Total)
Arsenic	(Dissolved)
Barium	(Total)
Barium	(Dissolved)
Benzene	71-43-2
Benzo[a]anthracene; Benzanthracene	56-55-3
Benzo[b]fluoranthene	205-99-2
Benzo[k]fluoranthene	207-08-9
Benzo[ghi]perylene	191-24-2
Benzo[a]pyrene	50-32-8
Benzyl alcohol	100-51-6
Beryllium	(Total)
Beryllium	(Dissolved)
alpha-BHC	319-84-6
beta-BHC	319-85-7
delta-BHC	319-86-8
gamma-BHC; Lindane	58-89-9
Bis(2-chloroethoxy) methane	111-91-1
Bis(2-chloroethyl) ether; Dichloroethyl ether	111-44-4
Bis(2-chloro-1-methylethyl) ether; 2,2-Dichlorodiisopropyl ether; DCHP (See note 3)	108-60-1
Bis(2-ethylhexyl) phthalate	117-81-7
Bromochloromethane; Chlorobromomethane	74-97-5
Bromodichloromethane; Dichlorobromomethane	75-27-4
Bromoform; Tribromomethane	75-25-2
4-Bromophenyl phenyl ether	101-55-3
Butyl benzyl phthalate; Benzyl butyl phthalate	85-68-7
Cadmium	(Total)
Cadmium	(Dissolved)
Carbon disulfide	75-15-0
Carbon tetrachloride	56-23-5
Chlordane	See note 4
p-Chloroaniline	106-47-8
Chlorobenzene	108-90-7
Chlorobenzilate	510-15-6
p-Chloro-m-cresol; 4-Chloro-3-methylphenol	59-50-7
Chloroethane; Ethyl chloride	75-00-3
Chloroform; Trichloromethane	67-66-3
2-Chloronaphthalene	91-58-7
2-Chlorophenol	95-57-8
4-Chlorophenyl phenyl ether	7005-72-3
Chloroprene	126-99-8
Chromium	(Total)
Chromium	(Dissolved)
Chrysene	218-01-9
Cobalt	(Total)
Cobalt	(Dissolved)

329 IAC 10-21-16 Constituents for assessment monitoring

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 16. (a) The following constituents in this section shall be subject to assessment monitoring procedures under section 10 of this rule.

TABLE 2

Constituents for Assessment Monitoring	
Common Name ¹	CAS RN ²
Acenaphthylene	208-96-8
Acenaphthene	83-32-9
Acetone	67-64-1
Acetonitrile; Methyl cyanide	75-05-8
Acetophenone	98-86-2
2-Acetylaminofluorene; 2-AAF	53-96-3
Acrolein	107-02-8
Acrylonitrile	107-13-1
Aldrin	309-00-2
Allyl chloride	107-05-1
4-Aminobiphenyl	92-67-1
Anthracene	120-12-7
Antimony	(Total)
Antimony	(Dissolved)
Arsenic	(Total)
Arsenic	(Dissolved)
Barium	(Total)
Barium	(Dissolved)
Benzene	71-43-2
Benzo[a]anthracene; Benzanthracene	56-55-3
Benzo[b]fluoranthene	205-99-2
Benzo[k]fluoranthene	207-08-9
Benzo[ghi]perylene	191-24-2
Benzo[a]pyrene	50-32-8
Benzyl alcohol	100-51-6
Beryllium	(Total)
Beryllium	(Dissolved)
alpha-BHC	319-84-6
beta-BHC	319-85-7
delta-BHC	319-86-8
gamma-BHC; Lindane	58-89-9
Bis(2-chloroethoxy) methane	111-91-1
Bis(2-chloroethyl) ether; Dichloroethyl ether	111-44-4
Bis(2-chloro-1-methylethyl) ether; 2,2-Dichlorodiisopropyl ether; DCHP (See note 3)	108-60-1
Bis(2-ethylhexyl) phthalate	117-81-7
Bromochloromethane; Chlorobromomethane	74-97-5
Bromodichloromethane; Dichlorobromomethane	75-27-4
Bromoform; Tribromomethane	75-25-2
4-Bromophenyl phenyl ether	101-55-3
Butyl benzyl phthalate; Benzyl butyl phthalate	85-68-7
Cadmium	(Total)
Cadmium	(Dissolved)
Carbon disulfide	75-15-0
Carbon tetrachloride	56-23-5
Chlordane	See note 4
p-Chloroaniline	106-47-8
Chlorobenzene	108-90-7
Chlorobenzilate	510-15-6
p-Chloro-m-cresol; 4-Chloro-3-methylphenol	59-50-7
Chloroethane; Ethyl chloride	75-00-3
Chloroform; Trichloromethane	67-66-3
2-Chloronaphthalene	91-58-7
2-Chlorophenol	95-57-8
4-Chlorophenyl phenyl ether	7005-72-3
Chloroprene	126-99-8
Chromium	(Total)
Chromium	(Dissolved)
Chrysene	218-01-9
Cobalt	(Total)
Cobalt	(Dissolved)

Copper	(Total)
Copper	(Dissolved)
m-Cresol; 3-Methylphenol	108-39-4
o-Cresol; 2-Methylphenol	95-48-7
p-Cresol; 4-Methylphenol	106-44-5
Cyanide	57-12-5
2,4-D; 2,4-Dichlorophenoxyacetic acid	94-75-7
4,4'-DDD	72-54-8
4,4'-DDE	72-55-9
4,4'-DDT	50-29-3
Diallate	2303-16-4
Dibenz[a,h]anthracene	53-70-3
Dibenzofuran	132-64-9
Dibromochloromethane; Chlorodibromomethane	124-48-1
1,2-Dibromo-3-chloropropane; DBCP	96-12-8
1,2-Dibromoethane; Ethylene dibromide; EDB	106-93-4
Di-n-butyl phthalate	84-74-2
o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1
m-Dichlorobenzene; 1,3-Dichlorobenzene	541-73-1
p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7
3,3'-Dichlorobenzidine	91-94-1
trans-1,4-Dichloro-2-butene	110-57-6
Dichlorodifluoromethane; CFC 12	75-71-8
1,1-Dichloroethane; Ethylidene chloride	75-34-3
1,2-Dichloroethane; Ethylene dichloride	107-06-2
1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride	75-35-4
cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2
trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene	156-60-5
2,4-Dichlorophenol	120-83-2
2,6-Dichlorophenol	87-65-0
1,2-Dichloropropane; Propylene dichloride	78-87-5
1,3-Dichloropropane; Trimethylene dichloride	142-28-9
2,2-Dichloropropane; Isopropylidene chloride	594-20-7
1,1-Dichloropropene	563-58-6
cis-1,3-Dichloropropene	10061-01-5
trans-1,3-Dichloropropene	10061-02-6
Dieldrin	60-57-1
Diethyl phthalate	84-66-2
0,0-Diethyl 0-2-pyrazinyl phosphorothioate; Thionazin	297-97-2
Dimethoate	60-51-5
p-(Dimethylamino)azobenzene	60-11-7
7,12-Dimethylbenz[a]anthracene	57-97-6
3,3'-Dimethylbenzidine	119-93-7
2,4-Dimethylphenol; m-Xylenol	105-67-9
Dimethyl phthalate	131-11-3
m-Dinitrobenzene	99-65-0
4,6-Dinitro-o-cresol; 4,6-Dinitro-2-methylphenol	534-52-1
2,4-Dinitrophenol	51-28-5
2,4-Dinitrotoluene	121-14-2
2,6-Dinitrotoluene	606-20-2
Dinoseb; DNDP; 2-sec-Butyl 4,6-dinitrophenol	88-85-7
Di-n-octyl phthalate	117-84-0
Diphenylamine	122-39-4
Disulfoton	298-04-4
Endosulfan I	959-98-8
Endosulfan II	33213-65-9
Endosulfan sulfate	1031-07-8
Endrin	72-20-8
Endrin aldehyde	7421-93-4
Ethylbenzene	100-41-4
Ethyl methacrylate	97-63-2
Ethyl methanesulfonate	62-50-0
Famphur	52-85-7
Fluoranthene	206-44-0
Fluorene	86-73-7
Fluoride	
Heptachlor	76-44-8
Heptachlor epoxide	1024-57-3
Hexachlorobenzene	118-74-1
Hexachlorobutadiene	87-68-3
Hexachlorocyclopentadiene	77-47-4
Hexachloroethane	67-72-1
Hexachloropropene	1888-71-7
2-Hexanone; methyl butyl ketone	591-78-6
Indeno(1,2,3-cd)pyrene	193-39-5
Isobutyl alcohol	78-83-1

Copper	(Total)
Copper	(Dissolved)
m-Cresol; 3-Methylphenol	108-39-4
o-Cresol; 2-Methylphenol	95-48-7
p-Cresol; 4-Methylphenol	106-44-5
Cyanide	57-12-5
2,4-D; 2,4-Dichlorophenoxyacetic acid	94-75-7
4,4'-DDD	72-54-8
4,4'-DDE	72-55-9
4,4'-DDT	50-29-3
Diallate	2303-16-4
Dibenz[a,h]anthracene	53-70-3
Dibenzofuran	132-64-9
Dibromochloromethane; Chlorodibromomethane	124-48-1
1,2-Dibromo-3-chloropropane; DBCP	96-12-8
1,2-Dibromoethane; Ethylene dibromide; EDB	106-93-4
Di-n-butyl phthalate	84-74-2
o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1
m-Dichlorobenzene; 1,3-Dichlorobenzene	541-73-1
p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7
3,3'-Dichlorobenzidine	91-94-1
trans-1,4-Dichloro-2-butene	110-57-6
Dichlorodifluoromethane; CFC 12	75-71-8
1,1-Dichloroethane; Ethylidene chloride	75-34-3
1,2-Dichloroethane; Ethylene dichloride	107-06-2
1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride	75-35-4
cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2
trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene	156-60-5
2,4-Dichlorophenol	120-83-2
2,6-Dichlorophenol	87-65-0
1,2-Dichloropropane; Propylene dichloride	78-87-5
1,3-Dichloropropane; Trimethylene dichloride	142-28-9
2,2-Dichloropropane; Isopropylidene chloride	594-20-7
1,1-Dichloropropene	563-58-6
cis-1,3-Dichloropropene	10061-01-5
trans-1,3-Dichloropropene	10061-02-6
Dieldrin	60-57-1
Diethyl phthalate	84-66-2
0,0-Diethyl 0-2-pyrazinyl phosphorothioate; Thionazin	297-97-2
Dimethoate	60-51-5
p-(Dimethylamino)azobenzene	60-11-7
7,12-Dimethylbenz[a]anthracene	57-97-6
3,3'-Dimethylbenzidine	119-93-7
2,4-Dimethylphenol; m-Xylenol	105-67-9
Dimethyl phthalate	131-11-3
m-Dinitrobenzene	99-65-0
4,6-Dinitro-o-cresol; 4,6-Dinitro-2-methylphenol	534-52-1
2,4-Dinitrophenol	51-28-5
2,4-Dinitrotoluene	121-14-2
2,6-Dinitrotoluene	606-20-2
Dinoseb; DNDP; 2-sec-Butyl 4,6-dinitrophenol	88-85-7
Di-n-octyl phthalate	117-84-0
Diphenylamine	122-39-4
Disulfoton	298-04-4
Endosulfan I	959-98-8
Endosulfan II	33213-65-9
Endosulfan sulfate	1031-07-8
Endrin	72-20-8
Endrin aldehyde	7421-93-4
Ethylbenzene	100-41-4
Ethyl methacrylate	97-63-2
Ethyl methanesulfonate	62-50-0
Famphur	52-85-7
Fluoranthene	206-44-0
Fluorene	86-73-7
Fluoride	
Heptachlor	76-44-8
Heptachlor epoxide	1024-57-3
Hexachlorobenzene	118-74-1
Hexachlorobutadiene	87-68-3
Hexachlorocyclopentadiene	77-47-4
Hexachloroethane	67-72-1
Hexachloropropene	1888-71-7
2-Hexanone; methyl butyl ketone	591-78-6
Indeno(1,2,3-cd)pyrene	193-39-5
Isobutyl alcohol	78-83-1

Isodrin	465-73-6
Isophorone	78-59-1
Isosafrole	120-58-1
Kepone	143-50-0
Lead	(Total)
Lead	(Dissolved)
Lithium	(Total)
Lithium	(Dissolved)
Mercury	(Total)
Mercury	(Dissolved)
Methacrylonitrile	126-98-7
Methapyrilene	91-80-5
Methoxychlor	72-43-5
Methyl bromide; Bromomethane	74-83-9
Methyl chloride; Chloromethane	74-87-3
3-Methylcholanthrene	56-49-5
Methyl ethyl ketone; MEK; 2-Butanone	78-93-3
Methyl iodide; Iodomethane	74-88-4
Methyl methacrylate	80-62-6
Methyl methanesulfonate	66-27-3
2-Methylnaphthalene	91-57-6
Methyl parathion; Parathion methyl	298-00-0
4-Methyl-2-pentanone; Methyl isobutyl ketone	108-10-1
Methylene bromide; Dibromomethane	74-95-3
Methylene chloride; Dichloromethane	75-09-2
Naphthalene	91-20-3
1,4-Naphthoquinone	130-15-4
1-Naphthylamine	134-32-7
2-Naphthylamine	91-59-8
Nickel	(Total)
Nickel	(Dissolved)
Nitrate (as N)	
o-Nitroaniline; 2-Nitroaniline	88-74-4
m-Nitroaniline; 3-Nitroaniline	99-09-2
p-Nitroaniline; 4-Nitroaniline	100-01-6
Nitrobenzene	98-95-3
o-Nitrophenol; 2-Nitrophenol	88-75-5
p-Nitrophenol; 4-Nitrophenol	100-02-7
N-Nitroso-di-n-butylamine	924-16-3
N-Nitrosodiethylamine	55-18-5
N-Nitrosodimethylamine	62-75-9
N-Nitrosodiphenylamine	86-30-6
N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine;	
Di-n-propylnitrosamine	621-64-7
N-Nitrosomethylethylamine	10595-95-6
N-Nitrosopiperidine	100-75-4
N-Nitrosopyrrolidine	930-55-2
5-Nitro-o-toluidine	99-55-8
Parathion	56-38-2
Pentachlorobenzene	608-93-5
Pentachloronitrobenzene	82-68-8
Pentachlorophenol	87-86-5
Phenacetin	62-44-2
Phenanthrene	85-01-8
Phenol	108-95-2
p-Phenylenediamine	106-50-3
Phorate	298-02-2
Polychlorinated biphenyls; PCBs; Aroclors	See note 5
Pronamide	23950-58-5
Propionitrile; Ethyl cyanide	107-12-0
Pyrene	129-00-0
Safrole	94-59-7
Selenium	(Total)
Selenium	(Dissolved)
Silver	(Total)
Silver	(Dissolved)
Silvex; 2,4,5-TP	93-72-1
Styrene	100-42-5
Sulfide	18496-25-8
2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid	93-76-5
1,2,4,5-Tetrachlorobenzene	95-94-3
1,1,1,2-Tetrachloroethane	630-20-6
1,1,2,2-Tetrachloroethane	79-34-5
Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	127-18-4
2,3,4,6-Tetrachlorophenol	58-90-2
Thallium	(Total)

Isodrin	465-73-6
Isophorone	78-59-1
Isosafrole	120-58-1
Kepone	143-50-0
Lead	(Total)
Lead	(Dissolved)
Lithium	(Total)
Lithium	(Dissolved)
Mercury	(Total)
Mercury	(Dissolved)
Methacrylonitrile	126-98-7
Methapyrilene	91-80-5
Methoxychlor	72-43-5
Methyl bromide; Bromomethane	74-83-9
Methyl chloride; Chloromethane	74-87-3
3-Methylcholanthrene	56-49-5
Methyl ethyl ketone; MEK; 2-Butanone	78-93-3
Methyl iodide; Iodomethane	74-88-4
Methyl methacrylate	80-62-6
Methyl methanesulfonate	66-27-3
2-Methylnaphthalene	91-57-6
Methyl parathion; Parathion methyl	298-00-0
4-Methyl-2-pentanone; Methyl isobutyl ketone	108-10-1
Methylene bromide; Dibromomethane	74-95-3
Methylene chloride; Dichloromethane	75-09-2
Naphthalene	91-20-3
1,4-Naphthoquinone	130-15-4
1-Naphthylamine	134-32-7
2-Naphthylamine	91-59-8
Nickel	(Total)
Nickel	(Dissolved)
Nitrate (as N)	
o-Nitroaniline; 2-Nitroaniline	88-74-4
m-Nitroaniline; 3-Nitroaniline	99-09-2
p-Nitroaniline; 4-Nitroaniline	100-01-6
Nitrobenzene	98-95-3
o-Nitrophenol; 2-Nitrophenol	88-75-5
p-Nitrophenol; 4-Nitrophenol	100-02-7
N-Nitroso-di-n-butylamine	924-16-3
N-Nitrosodiethylamine	55-18-5
N-Nitrosodimethylamine	62-75-9
N-Nitrosodiphenylamine	86-30-6
N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine;	
Di-n-propylnitrosamine	621-64-7
N-Nitrosomethylethylamine	10595-95-6
N-Nitrosopiperidine	100-75-4
N-Nitrosopyrrolidine	930-55-2
5-Nitro-o-toluidine	99-55-8
Parathion	56-38-2
Pentachlorobenzene	608-93-5
Pentachloronitrobenzene	82-68-8
Pentachlorophenol	87-86-5
Phenacetin	62-44-2
Phenanthrene	85-01-8
Phenol	108-95-2
p-Phenylenediamine	106-50-3
Phorate	298-02-2
Polychlorinated biphenyls; PCBs; Aroclors	See note 5
Pronamide	23950-58-5
Propionitrile; Ethyl cyanide	107-12-0
Pyrene	129-00-0
Safrole	94-59-7
Selenium	(Total)
Selenium	(Dissolved)
Silver	(Total)
Silver	(Dissolved)
Silvex; 2,4,5-TP	93-72-1
Styrene	100-42-5
Sulfide	18496-25-8
2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid	93-76-5
1,2,4,5-Tetrachlorobenzene	95-94-3
1,1,1,2-Tetrachloroethane	630-20-6
1,1,2,2-Tetrachloroethane	79-34-5
Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	127-18-4
2,3,4,6-Tetrachlorophenol	58-90-2
Thallium	(Total)

Thallium	(Dissolved)
Tin	(Total)
Tin	(Dissolved)
Toluene	108-88-3
o-Toluidine	95-53-4
Toxaphene	See note 6
1,2,4-Trichlorobenzene	120-82-1
1,1,1-Trichloroethane; Methylchloroform	71-55-6
1,1,2-Trichloroethane	79-00-5
Trichloroethylene; Trichloroethene	79-01-6
Trichlorofluoromethane; CFC-11	75-69-4
2,4,5-Trichlorophenol	95-95-4
2,4,6-Trichlorophenol	88-06-2
1,2,3-Trichloropropane	96-18-4
0,0,0-Trichlryl phosphorothioate	126-68-1
sym-Trinitrobenzene	99-35-4
Vanadium	(Total)
Vanadium	(Dissolved)
Vinyl acetate	108-05-4
Vinyl chloride; Chloroethene	75-01-4
Xylene (Total)	See note 7
Zinc	(Total)
Zinc	(Dissolved)

(b) The following metals (dissolved and total):

TABLE 2

Constituents for Assessment Monitoring

Common Name ¹	CAS RN ²
(1) Antimony	(Total)
(2) Antimony	(Dissolved)
(3) Arsenic	(Total)
(4) Arsenic	(Dissolved)
(5) Barium	(Total)
(6) Barium	(Dissolved)
(7) Beryllium	(Total)
(8) Beryllium	(Dissolved)
(9) Cadmium	(Total)
(10) Cadmium	(Dissolved)
(11) Chromium	(Total)
(12) Chromium	(Dissolved)
(13) Cobalt	(Total)
(14) Cobalt	(Dissolved)
(15) Copper	(Total)
(16) Copper	(Dissolved)
(17) Lead	(Total)
(18) Lead	(Dissolved)
(19) Lithium	(Total)
(20) Lithium	(Dissolved)
(21) Mercury	(Total)
(22) Mercury	(Dissolved)
(23) Nickel	(Total)
(24) Nickel	(Dissolved)
(25) Selenium	(Total)
(26) Selenium	(Dissolved)
(27) Silver	(Total)
(28) Silver	(Dissolved)
(29) Thallium	(Total)
(30) Thallium	(Dissolved)
(31) Tin	(Total)
(32) Tin	(Dissolved)
(33) Vanadium	(Total)
(34) Vanadium	(Dissolved)
(35) Zinc	(Total)
(36) Zinc	(Dissolved)

(c) The following inorganics:

TABLE 2

Constituents for Assessment Monitoring

Common Name ¹	CAS RN ²
(1) Cyanide	57-12-5
(2) Fluoride	
(3) Nitrate (as N)	
(4) Sulfide	18496-25-8

Thallium	(Dissolved)
Tin	(Total)
Tin	(Dissolved)
Toluene	108-88-3
o-Toluidine	95-53-4
Toxaphene	See note 6
1,2,4-Trichlorobenzene	120-82-1
1,1,1-Trichloroethane; Methylchloroform	71-55-6
1,1,2-Trichloroethane	79-00-5
Trichloroethylene; Trichloroethene	79-01-6
Trichlorofluoromethane; CFC-11	75-69-4
2,4,5-Trichlorophenol	95-95-4
2,4,6-Trichlorophenol	88-06-2
1,2,3-Trichloropropane	96-18-4
0,0,0-Trichlryl phosphorothioate	126-68-1
sym-Trinitrobenzene	99-35-4
Vanadium	(Total)
Vanadium	(Dissolved)
Vinyl acetate	108-05-4
Vinyl chloride; Chloroethene	75-01-4
Xylene (Total)	See note 7
Zinc	(Total)
Zinc	(Dissolved)

(b) The following metals (dissolved and total):

TABLE 2

Constituents for Assessment Monitoring

Common Name ¹	CAS RN ²
(1) Antimony	(Total)
(2) Antimony	(Dissolved)
(3) Arsenic	(Total)
(4) Arsenic	(Dissolved)
(5) Barium	(Total)
(6) Barium	(Dissolved)
(7) Beryllium	(Total)
(8) Beryllium	(Dissolved)
(9) Cadmium	(Total)
(10) Cadmium	(Dissolved)
(11) Chromium	(Total)
(12) Chromium	(Dissolved)
(13) Cobalt	(Total)
(14) Cobalt	(Dissolved)
(15) Copper	(Total)
(16) Copper	(Dissolved)
(17) Lead	(Total)
(18) Lead	(Dissolved)
(19) Lithium	(Total)
(20) Lithium	(Dissolved)
(21) Mercury	(Total)
(22) Mercury	(Dissolved)
(23) Nickel	(Total)
(24) Nickel	(Dissolved)
(25) Selenium	(Total)
(26) Selenium	(Dissolved)
(27) Silver	(Total)
(28) Silver	(Dissolved)
(29) Thallium	(Total)
(30) Thallium	(Dissolved)
(31) Tin	(Total)
(32) Tin	(Dissolved)
(33) Vanadium	(Total)
(34) Vanadium	(Dissolved)
(35) Zinc	(Total)
(36) Zinc	(Dissolved)

(c) The following inorganics:

TABLE 2

Constituents for Assessment Monitoring

Common Name ¹	CAS RN ²
(1) Cyanide	57-12-5
(2) Fluoride	
(3) Nitrate (as N)	
(4) Sulfide	18496-25-8

(d) The following volatile organic compounds:

TABLE 2

Constituents for Assessment Monitoring

Common Name ¹	CAS RN ²
(1) Acetone	67-64-1
(2) Acetonitrile; Methyl cyanide	75-05-8
(3) Acrolein	107-02-8
(4) Acrylonitrile	107-13-1
(5) Allyl chloride	107-05-1
(6) Benzene	71-43-2
(7) Bromochloromethane; Chlorobromomethane	74-97-5
(8) Bromodichloromethane; Dichlorobromomethane	75-27-4
(9) Bromoform; Tribromomethane	75-25-2
(10) Carbon disulfide	75-15-0
(11) Carbon tetrachloride	56-23-5
(12) Chlorobenzene	108-90-7
(13) Chloroethane; Ethyl chloride	75-00-3
(14) Chloroform; Trichloromethane	67-66-3
(15) Chloroprene	126-99-8
(16) Dibromochloromethane; Chlorodibromomethane	124-48-1
(17) 1,2-Dibromo-3-chloropropane; DBCP	96-12-8
(18) 1,2-Dibromoethane; Ethylene dibromide; EDB	106-93-4
(19) o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1
(20) m-Dichlorobenzene; 1,3-Dichlorobenzene	541-73-1
(21) p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7
(22) trans-1,4-Dichloro-2-butene	110-57-6
(23) Dichlorodifluoromethane; CFC 12	75-71-8
(24) 1,1-Dichloroethane; Ethylidene chloride	75-34-3
(25) 1,2-Dichloroethane; Ethylene dichloride	107-06-2
(26) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride	75-35-4
(27) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2
(28) trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene	156-60-5
(29) 1,2-Dichloropropane; Propylene dichloride	78-87-5
(30) 1,3-Dichloropropane; Trimethylene dichloride	142-28-9
(31) 2,2-Dichloropropane; Isopropylidene chloride	594-20-7
(32) 1,1-Dichloropropene	563-58-6
(33) cis-1,3-Dichloropropene	10061-01-5
(34) trans-1,3-Dichloropropene	10061-02-6
(35) Ethylbenzene	100-41-4
(36) 2-Hexanone; methyl butyl ketone	591-78-6
(37) Isobutyl alcohol	78-83-1
(38) Methacrylonitrile	126-98-7
(39) Methyl bromide; Bromomethane	74-83-9
(40) Methyl chloride; Chloromethane	74-87-3
(41) Methyl ethyl ketone; MEK; 2-Butanone	78-93-3
(42) Methyl iodide; Iodomethane	74-88-4
(43) Methyl methacrylate	80-62-6
(44) Methyl parathion; Parathion methyl	298-00-0
(45) 4-Methyl-2-pentanone; Methyl isobutyl ketone	108-10-1
(46) Methylene bromide; Dibromomethane	74-95-3
(47) Methylene chloride; Dichloromethane	75-09-2
(48) Styrene	100-42-5
(49) 1,1,1,2-Tetrachloroethane	630-20-6
(50) 1,1,2,2-Tetrachloroethane	79-34-5
(51) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	127-18-4
(52) Toluene	108-88-3
(53) 1,1,1-Trichloroethane; Methylchloroform	71-55-6
(54) 1,1,2-Trichloroethane	79-00-5
(55) Trichloroethylene; Trichloroethene	79-01-6
(56) Trichlorofluoromethane; CFC-11	75-69-4
(57) 1,2,3-Trichloropropane	96-18-4
(58) Vinyl acetate	108-05-4
(59) Vinyl chloride; Chloroethene	75-01-4
(60) Xylene (Total)	See note 3

(d) The following volatile organic compounds:

TABLE 2

Constituents for Assessment Monitoring

Common Name ¹	CAS RN ²
(1) Acetone	67-64-1
(2) Acetonitrile; Methyl cyanide	75-05-8
(3) Acrolein	107-02-8
(4) Acrylonitrile	107-13-1
(5) Allyl chloride	107-05-1
(6) Benzene	71-43-2
(7) Bromochloromethane; Chlorobromomethane	74-97-5
(8) Bromodichloromethane; Dichlorobromomethane	75-27-4
(9) Bromoform; Tribromomethane	75-25-2
(10) Carbon disulfide	75-15-0
(11) Carbon tetrachloride	56-23-5
(12) Chlorobenzene	108-90-7
(13) Chloroethane; Ethyl chloride	75-00-3
(14) Chloroform; Trichloromethane	67-66-3
(15) Chloroprene	126-99-8
(16) Dibromochloromethane; Chlorodibromomethane	124-48-1
(17) 1,2-Dibromo-3-chloropropane; DBCP	96-12-8
(18) 1,2-Dibromoethane; Ethylene dibromide; EDB	106-93-4
(19) o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1
(20) m-Dichlorobenzene; 1,3-Dichlorobenzene	541-73-1
(21) p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7
(22) trans-1,4-Dichloro-2-butene	110-57-6
(23) Dichlorodifluoromethane; CFC 12	75-71-8
(24) 1,1-Dichloroethane; Ethylidene chloride	75-34-3
(25) 1,2-Dichloroethane; Ethylene dichloride	107-06-2
(26) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride	75-35-4
(27) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2
(28) trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene	156-60-5
(29) 1,2-Dichloropropane; Propylene dichloride	78-87-5
(30) 1,3-Dichloropropane; Trimethylene dichloride	142-28-9
(31) 2,2-Dichloropropane; Isopropylidene chloride	594-20-7
(32) 1,1-Dichloropropene	563-58-6
(33) cis-1,3-Dichloropropene	10061-01-5
(34) trans-1,3-Dichloropropene	10061-02-6
(35) Ethylbenzene	100-41-4
(36) 2-Hexanone; methyl butyl ketone	591-78-6
(37) Isobutyl alcohol	78-83-1
(38) Methacrylonitrile	126-98-7
(39) Methyl bromide; Bromomethane	74-83-9
(40) Methyl chloride; Chloromethane	74-87-3
(41) Methyl ethyl ketone; MEK; 2-Butanone	78-93-3
(42) Methyl iodide; Iodomethane	74-88-4
(43) Methyl methacrylate	80-62-6
(44) Methyl parathion; Parathion methyl	298-00-0
(45) 4-Methyl-2-pentanone; Methyl isobutyl ketone	108-10-1
(46) Methylene bromide; Dibromomethane	74-95-3
(47) Methylene chloride; Dichloromethane	75-09-2
(48) Styrene	100-42-5
(49) 1,1,1,2-Tetrachloroethane	630-20-6
(50) 1,1,2,2-Tetrachloroethane	79-34-5
(51) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	127-18-4
(52) Toluene	108-88-3
(53) 1,1,1-Trichloroethane; Methylchloroform	71-55-6
(54) 1,1,2-Trichloroethane	79-00-5
(55) Trichloroethylene; Trichloroethene	79-01-6
(56) Trichlorofluoromethane; CFC-11	75-69-4
(57) 1,2,3-Trichloropropane	96-18-4
(58) Vinyl acetate	108-05-4
(59) Vinyl chloride; Chloroethene	75-01-4
(60) Xylene (Total)	See note 3

(e) The following semivolatile organic compounds:

TABLE 2

Constituents for Assessment Monitoring

Common Name ¹	CAS RN ²
(1) Acenaphthylene	208-96-8
(2) Acenaphthene	83-32-9
(3) Acetophenone	98-86-2
(4) 2-Acetylaminofluorene; 2-AAF	53-96-3
(5) 4-Aminobiphenyl	92-67-1
(6) Anthracene	120-12-7
(7) Benzo[a]anthracene; Benzanthracene	56-55-3
(8) Benzo[b]fluoranthene	205-99-2
(9) Benzo[k]fluoranthene	207-08-9
(10) Benzo[ghi]perylene	191-24-2
(11) Benzo[a]pyrene	50-32-8
(12) Benzyl alcohol	100-51-6
(13) Bis(2-chloroethoxy) methane	111-91-1
(14) Bis(2-chloroethyl) ether; Dichloroethyl ether	111-44-4
(15) Bis(2-chloro-1-methylethyl) ether; 2,2-Dichlorodiisopropyl ether; DCIP (See note 4)	108-60-1
(16) Bis(2-ethylhexyl) phthalate	117-81-7
(17) 4-Bromophenyl phenyl ether	101-55-3
(18) Butyl benzyl phthalate; Benzyl butyl phthalate	85-68-7
(19) p-Chloroaniline	106-47-8
(20) Chlorobenzilate	510-15-6
(21) p-Chloro-m-cresol; 4-Chloro-3-methylphenol	59-50-7
(22) 2-Chloronaphthalene	91-58-7
(23) 2-Chlorophenol	95-57-8
(24) 4-Chlorophenyl phenyl ether	7005-72-3
(25) Chrysene	218-01-9
(26) m-Cresol; 3-Methylphenol	108-39-4
(27) o-Cresol; 2-Methylphenol	95-48-7
(28) p-Cresol; 4-Methylphenol	106-44-5
(29) Diallate	2303-16-4
(30) Dibenz[a,h]anthracene	53-70-3
(31) Dibenzofuran	132-64-9
(32) Di-n-butyl phthalate	84-74-2
(33) 3,3'-Dichlorobenzidine	91-94-1
(34) 2,4-Dichlorophenol	120-83-2
(35) 2,6-Dichlorophenol	87-65-0
(36) Di(2-ethylhexyl)adipate; DOA	103-23-1
(37) Diethyl phthalate	84-66-2
(38) p-(Dimethylamino)azobenzene	60-11-7
(39) 7,12-Dimethylbenz[a]anthracene	57-97-6
(40) 3,3'-Dimethylbenzidine	119-93-7
(41) 2,4-Dimethylphenol; m-Xylenol	105-67-9
(42) Dimethyl phthalate	131-11-3
(43) m-Dinitrobenzene	99-65-0
(44) 4,6-Dinitro-o-cresol; 4,6-Dinitro-2-methylphenol	534-52-1
(45) 2,4-Dinitrophenol	51-28-5
(46) 2,4-Dinitrotoluene	121-14-2
(47) 2,6-Dinitrotoluene	606-20-2
(48) Di-n-octyl phthalate	117-84-0
(49) Diphenylamine	122-39-4
(50) Ethyl methacrylate	97-63-2
(51) Famphur	52-85-7
(52) Fluoranthene	206-44-0
(53) Fluorene	86-73-7
(54) Hexachlorobenzene	118-74-1
(55) Hexachlorobutadiene	87-68-3
(56) Hexachlorocyclopentadiene	77-47-4
(57) Hexachloroethane	67-72-1
(58) Hexachloropropene	1888-71-7
(59) Indeno(1,2,3-cd)pyrene	193-39-5
(60) Isodrin	465-73-6
(61) Isophorone	78-59-1
(62) Isosafrole	120-58-1
(63) Kepone	143-50-0
(64) Methapyrilene	91-80-5
(65) 3-Methylcholanthrene	56-49-5
(66) Methyl methanesulfonate	66-27-3
(67) 2-Methylnaphthalene	91-57-6
(68) Naphthalene	91-20-3

(e) The following semi-volatile organic compounds:

TABLE 2

Constituents for Assessment Monitoring

Common Name ¹	CAS RN ²
(1) Acenaphthylene	208-96-8
(2) Acenaphthene	83-32-9
(3) Acetophenone	98-86-2
(4) 2-Acetylaminofluorene; 2-AAF	53-96-3
(5) 4-Aminobiphenyl	92-67-1
(6) Anthracene	120-12-7
(7) Benzo[a]anthracene; Benzanthracene	56-55-3
(8) Benzo[b]fluoranthene	205-99-2
(9) Benzo[k]fluoranthene	207-08-9
(10) Benzo[ghi]perylene	191-24-2
(11) Benzo[a]pyrene	50-32-8
(12) Benzyl alcohol	100-51-6
(13) Bis(2-chloroethoxy) methane	111-91-1
(14) Bis(2-chloroethyl) ether; Dichloroethyl ether	111-44-4
(15) Bis(2-chloro-1-methylethyl) ether; 2,2-Dichlorodiisopropyl ether; DCIP (See note 4)	108-60-1
(16) Bis(2-ethylhexyl) phthalate	117-81-7
(17) 4-Bromophenyl phenyl ether	101-55-3
(18) Butyl benzyl phthalate; Benzyl butyl phthalate	85-68-7
(19) p-Chloroaniline	106-47-8
(20) Chlorobenzilate	510-15-6
(21) p-Chloro-m-cresol; 4-Chloro-3-methylphenol	59-50-7
(22) 2-Chloronaphthalene	91-58-7
(23) 2-Chlorophenol	95-57-8
(24) 4-Chlorophenyl phenyl ether	7005-72-3
(25) Chrysene	218-01-9
(26) m-Cresol; 3-Methylphenol	108-39-4
(27) o-Cresol; 2-Methylphenol	95-48-7
(28) p-Cresol; 4-Methylphenol	106-44-5
(29) Diallate	2303-16-4
(30) Dibenz[a,h]anthracene	53-70-3
(31) Dibenzofuran	132-64-9
(32) Di-n-butyl phthalate	84-74-2
(33) 3,3'-Dichlorobenzidine	91-94-1
(34) 2,4-Dichlorophenol	120-83-2
(35) 2,6-Dichlorophenol	87-65-0
(36) Diethyl phthalate	84-66-2
(37) p-(Dimethylamino)azobenzene	60-11-7
(38) 7,12-Dimethylbenz[a]anthracene	57-97-6
(39) 3,3'-Dimethylbenzidine	119-93-7
(40) 2,4-Dimethylphenol; m-Xylenol	105-67-9
(41) Dimethyl phthalate	131-11-3
(42) m-Dinitrobenzene	99-65-0
(43) 4,6-Dinitro-o-cresol; 4,6-Dinitro-2-methylphenol	534-52-1
(44) 2,4-Dinitrophenol	51-28-5
(45) 2,4-Dinitrotoluene	121-14-2
(46) 2,6-Dinitrotoluene	606-20-2
(47) Di-n-octyl phthalate	117-84-0
(48) Diphenylamine	122-39-4
(49) Ethyl methacrylate	97-63-2
(50) Famphur	52-85-7
(51) Fluoranthene	206-44-0
(52) Fluorene	86-73-7
(53) Hexachlorobenzene	118-74-1
(54) Hexachlorobutadiene	87-68-3
(55) Hexachlorocyclopentadiene	77-47-4
(56) Hexachloroethane	67-72-1
(57) Hexachloropropene	1888-71-7
(58) Indeno(1,2,3-cd)pyrene	193-39-5
(59) Isodrin	465-73-6
(60) Isophorone	78-59-1
(61) Isosafrole	120-58-1
(62) Kepone	143-50-0
(63) Methapyrilene	91-80-5
(64) 3-Methylcholanthrene	56-49-5
(65) Methyl methanesulfonate	66-27-3
(66) 2-Methylnaphthalene	91-57-6
(67) Naphthalene	91-20-3

(69) 1,4-Naphthoquinone	130-15-4
(70) 1-Naphthylamine	134-32-7
(71) 2-Naphthylamine	91-59-8
(72) o-Nitroaniline; 2-Nitroaniline	88-74-4
(73) m-Nitroaniline; 3-Nitroaniline	99-09-2
(74) p-Nitroaniline; 4-Nitroaniline	100-01-6
(75) Nitrobenzene	98-95-3
(76) o-Nitrophenol; 2-Nitrophenol	88-75-5
(77) p-Nitrophenol; 4-Nitrophenol	100-02-7
(78) N-Nitroso-di-n-butylamine	924-16-3
(79) N-Nitrosodiethylamine	55-18-5
(80) N-Nitrosodimethylamine	62-75-9
(81) N-Nitrosodiphenylamine	86-30-6
(82) N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine	621-64-7
(83) N-Nitrosomethylethylamine	10595-95-6
(84) N-Nitrosopiperidine	100-75-4
(85) N-Nitrosopyrrolidine	930-55-2
(86) 5-Nitro-o-toluidine	99-55-8
(87) Pentachlorobenzene	608-93-5
(88) Pentachloronitrobenzene	82-68-8
(89) Pentachlorophenol	87-86-5
(90) Phenacetin	62-44-2
(91) Phenanthrene	85-01-8
(92) Phenol	108-95-2
(93) p-Phenylenediamine	106-50-3
(94) Pronamide	23950-58-5
(95) Propionitrile; Ethyl cyanide	107-12-0
(96) Pyrene	129-00-0
(97) Saffrole	94-59-7
(98) 1,2,4,5-Tetrachlorobenzene	95-94-3
(99) 2,3,4,6-Tetrachlorophenol	58-90-2
(100) o-Toluidine	95-53-4
(101) 1,2,4-Trichlorobenzene	120-82-1
(102) 2,4,5-Trichlorophenol	95-95-4
(103) 2,4,6-Trichlorophenol	88-06-2
(104) 0,0,0-Triethyl phosphorothioate	126-68-1
(105) sym-Trinitrobenzene	99-35-4

(f) The following pesticides, herbicides, and PCBs:

TABLE 2 Constituents for Assessment Monitoring	
Common Name ¹	CAS RN ²
(1) Alachlor	15972-60-8
(2) Aldrin	309-00-2
(3) Atrazine	1912-24-9
(4) alpha-BHC	319-84-6
(5) beta-BHC	319-85-7
(6) delta-BHC	319-86-8
(7) gamma-BHC; Lindane	58-89-9
(8) Carbofuran	1563-66-2
(9) Chlordane	See note 5
(10) Dalapon	75-99-0
(11) 2,4-D; 2,4-Dichlorophenoxyacetic acid	94-75-7
(12) 4,4'-DDD	72-54-8
(13) 4,4'-DDE	72-55-9
(14) 4,4'-DDT	50-29-3
(15) Dieldrin	60-57-1
(16) 0,0-Diethyl 0-2-pyrazinyl phosphorothioate; Thionazin	297-97-2
(17) Dimethoate	60-51-5
(18) Dinoseb; DNBP; 2-sec-Butyl-4,6-dinitrophenol	88-85-7
(19) Diquat	85-00-7
(20) Disulfoton	298-04-4
(21) Endosulfan I	959-98-8
(22) Endosulfan II	33213-65-9
(23) Endosulfan sulfate	1031-07-8
(24) Endothall	145-73-3
(25) Endrin	72-20-8
(26) Endrin aldehyde	7421-93-4
(27) Ethyl methanesulfonate	62-50-0
(28) Glyphosate	1071-83-6
(29) Heptachlor	76-44-8
(30) Heptachlor epoxide	1024-57-3

(68) 1,4-Naphthoquinone	130-15-4
(69) 1-Naphthylamine	134-32-7
(70) 2-Naphthylamine	91-59-8
(71) o-Nitroaniline; 2-Nitroaniline	88-74-4
(72) m-Nitroaniline; 3-Nitroaniline	99-09-2
(73) p-Nitroaniline; 4-Nitroaniline	100-01-6
(74) Nitrobenzene	98-95-3
(75) o-Nitrophenol; 2-Nitrophenol	88-75-5
(76) p-Nitrophenol; 4-Nitrophenol	100-02-7
(77) N-Nitroso-di-n-butylamine	924-16-3
(78) N-Nitrosodiethylamine	55-18-5
(79) N-Nitrosodimethylamine	62-75-9
(80) N-Nitrosodiphenylamine	86-30-6
(81) N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine	621-64-7
(82) N-Nitrosomethylethylamine	10595-95-6
(83) N-Nitrosopiperidine	100-75-4
(84) N-Nitrosopyrrolidine	930-55-2
(85) 5-Nitro-o-toluidine	99-55-8
(86) Pentachlorobenzene	608-93-5
(87) Pentachloronitrobenzene	82-68-8
(88) Pentachlorophenol	87-86-5
(89) Phenacetin	62-44-2
(90) Phenanthrene	85-01-8
(91) Phenol	108-95-2
(92) p-Phenylenediamine	106-50-3
(93) Pronamide	23950-58-5
(94) Propionitrile; Ethyl cyanide	107-12-0
(95) Pyrene	129-00-0
(96) Saffrole	94-59-7
(97) 1,2,4,5-Tetrachlorobenzene	95-94-3
(98) 2,3,4,6-Tetrachlorophenol	58-90-2
(99) o-Toluidine	95-53-4
(100) 1,2,4-Trichlorobenzene	120-82-1
(101) 2,4,5-Trichlorophenol	95-95-4
(102) 2,4,6-Trichlorophenol	88-06-2
(103) 0,0,0-Triethyl phosphorothioate	126-68-1
(104) sym-Trinitrobenzene	99-35-4

(f) The following pesticides, herbicides, and PCBs:

TABLE 2 Constituents for Assessment Monitoring	
Common Name ¹	CAS RN ²
(1) Aldrin	309-00-2
(2) alpha-BHC	319-84-6
(3) beta-BHC	319-85-7
(4) delta-BHC	319-86-8
(5) gamma-BHC; Lindane	58-89-9
(6) Chlordane	See note 5
(7) 2,4-D; 2,4-Dichlorophenoxyacetic acid	94-75-7
(8) 4,4'-DDD	72-54-8
(9) 4,4'-DDE	72-55-9
(10) 4,4'-DDT	50-29-3
(11) Dieldrin	60-57-1
(12) 0,0-Diethyl 0-2-pyrazinyl phosphorothioate; Thionazin	297-97-2
(13) Dimethoate	60-51-5
(14) Dinoseb; DNBP; 2-sec-Butyl-4,6-dinitrophenol	88-85-7
(15) Disulfoton	298-04-4
(16) Endosulfan I	959-98-8
(17) Endosulfan II	33213-65-9
(18) Endosulfan sulfate	1031-07-8
(19) Endrin	72-20-8
(20) Endrin aldehyde	7421-93-4
(21) Ethyl methanesulfonate	62-50-0
(22) Heptachlor	76-44-8
(23) Heptachlor epoxide	1024-57-3
(24) Methoxychlor	72-43-5
(25) Parathion	56-38-2
(26) Phorate	298-02-2
(27) Polychlorinated biphenyls; PCBs; Aroclors	See note 6
(28) Silvex; 2,4,5-TP	93-72-1
(29) 2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid	93-76-5

(31) Methoxychlor	72-43-5
(32) Oxamyl	23135-22-0
(33) Parathion	56-38-2
(34) Phorate	298-02-2
(35) Picloram	1918-02-1
(36) Polychlorinated biphenyls; PCBs; Aroclors	See note 6
(37) Silvex; 2,4,5-TP	93-72-1
(38) Simazine	122-34-9
(39) 2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid	93-76-5
(40) Toxaphene	See note 7

(g) The following miscellaneous constituents:

TABLE 2

Constituents for Assessment Monitoring

<u>Common Name¹</u>	<u>CAS RN²</u>
(1) Asbestos	132207-33-1
(2) Combined beta/photon emitters	
(3) Gross alpha particle activity (including radium 226, but excluding radon and uranium)	
(4) Radium 226 and 228 (combined)	
(5) 2,3,7,8 -TCDD (Dioxin)	1746-01-6

(h) The following notes apply to subsections

(b) through (g):

¹Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

²Chemical Abstracts Service registry number. Where “Total” is entered, all species in the ground water that contain this element are included. Where “Dissolved” is entered, all species in a filtered sample of the ground water that contain this element are included.

³**Xylene (total).** This entry includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330-20-7).

^{3,4}This substance is often called Bis(2-chloroisopropyl) ether, the name Chemical Abstracts Service applies to its noncommercial isomer, Propane, 2,2'-oxybis[2-chloro- (CAS RN 39638-32-9).

^{4,5}Chlordane. This entry includes alpha-chlordane (CAS RN 5103-71-9), beta-chlordane (CAS RN 5103-74-2), gamma-chlordane (CAS RN 5566-34-7), and constituents of chlordane (CAS RN 57-74-9 and CAS RN 12789-03-6).

⁶Polychlorinated biphenyls (CAS RN 1336-36-3). This category contains congener chemicals, including constituents of Aroclor 1016 (CAS RN 12674-11-2), Aroclor 1221 (CAS RN 11104-28-2), Aroclor 1232 (CAS RN 11141-16-5), Aroclor 1242 (CAS RN 53469-21-9), Aroclor 1248 (CAS RN 12672-29-6), Aroclor 1254 (CAS RN 11097-69-1), and Aroclor 1260 (CAS RN 11096-82-5).

^{6,7}Toxaphene. This entry includes congener chemicals contained in technical toxaphene (CAS RN 8001-35-2), that is, chlorinated camphene.

²**Xylene (total).** This entry includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330-20-7).

(30) Toxaphene See note 7
Notes:

¹Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

²Chemical Abstracts Service registry number. Where “Total” is entered, all species in the ground water that contain this element are included. Where “Dissolved” is entered, all species in a filtered sample of the ground water that contain this element are included.

³**Xylene (total).** This entry includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330-20-7).

^{3,4}This substance is often called Bis(2-chloroisopropyl) ether, the name Chemical Abstracts Service applies to its noncommercial isomer, Propane, 2,2'-oxybis[2-chloro- (CAS RN 39638-32-9).

^{4,5}Chlordane. This entry includes alpha-chlordane (CAS RN 5103-71-9), beta-chlordane (CAS RN 5103-74-2), gamma-chlordane (CAS RN 5566-34-7), and constituents of chlordane (CAS RN 57-74-9 and CAS RN 12789-03-6).

⁶Polychlorinated biphenyls (CAS RN 1336-36-3). This category contains congener chemicals, including constituents of Aroclor 1016 (CAS RN 12674-11-2), Aroclor 1221 (CAS RN 11104-28-2), Aroclor 1232 (CAS RN 11141-16-5), Aroclor 1242 (CAS RN 53469-21-9), Aroclor 1248 (CAS RN 12672-29-6), Aroclor 1254 (CAS RN 11097-69-1), and Aroclor 1260 (CAS RN 11096-82-5).

^{6,7}Toxaphene. This entry includes congener chemicals contained in technical toxaphene (CAS RN 8001-35-2), that is, chlorinated camphene.

²**Xylene (total).** This entry includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330-20-7).

Added new section:

329 IAC 10-21-17 Additional constituents for assessment monitoring

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1

Affected: IC 13-30-2; IC 36-9-30

Sec. 17. The following additional constituents shall be subject to assessment monitoring procedures under section 10 of this rule:

TABLE 3

Additional Constituents for Assessment Monitoring

<u>Common Name¹</u>	<u>CAS RN²</u>
(1) Asbestos	132207-33-1
(2) Combined beta/photon emitters	

329 IAC 10-22-2 Closure plan

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 2. (a) The owner, operator, or permittee of an MSWLF shall prepare a written closure plan. The plan must be submitted with the permit application in accordance with 329 IAC 10-11 and be approved by the commissioner as part of the permit. The approved closure plan becomes a condition of the permit upon approval.

(b) The owner, operator, or permittee of ~~MSWLFs~~ **an MSWLF** permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, that:

- (1) closed on or before January 1, 1998, must close under the MSWLF's existing approved closure plans; or
- (2) intend to close after January 1, 1998, must:
 - (A) revise closure plans to meet the requirements of subsection (c); and
 - (B) submit the revised plans to the commissioner for approval within six (6) months after the effective date of this article or the anniversary date of the approved closure plans, whichever is earlier.

(c) The closure plan must identify the steps necessary to completely close the MSWLF at any point during its active life in accordance with section 1 of this rule. The plan must be certified by a registered professional engineer. The closure plan must include the following:

- (1) A description of the steps that will be used to partially close, if applicable, and finally close the MSWLF in accordance with section 1 of this rule.
- (2) A listing of labor, materials, and testing

(3) Gross alpha particle activity (including radium 226, but excluding radon and uranium)	
(4) Radium 226 and 228 (combined)	7440-14-4
(5) Alachlor	15972-60-8
(6) Atrazine	1912-24-9
(7) Carbofuran	1563-66-2
(8) Dalapon	75-99-0
(9) Di(2-ethylhexyl)adipate; DOA	103-23-1
(10) Diquat	231-36-7
(11) Endothall	145-73-3
(12) Glyphosate	1071-83-6
(13) Oxamyl	23135-22-0
(14) Picloram	1918-02-1
(15) Simazine	122-34-9
(16) 2, 3, 7, 8 -TCDD (Dioxin)	1746-01-6

Notes:

¹Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

²Chemical Abstracts Service registry number.

329 IAC 10-22-2 Closure plan

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 2. (a) The owner, operator, or permittee of an MSWLF shall prepare a written closure plan. The plan must be submitted with the permit application in accordance with 329 IAC 10-11 and be approved by the commissioner as part of the permit. The approved closure plan becomes a condition of the permit upon approval.

(b) The owner, operator, or permittee of ~~MSWLFs~~ **an MSWLF** permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, that:

- (1) closed on or before January 1, 1998, must close under the MSWLF's existing approved closure plans; or
- (2) intend to close after January 1, 1998, must:
 - (A) revise closure plans to meet the requirements of subsection (c); and
 - (B) submit the revised plans to the commissioner for approval within six (6) months after ~~the effective date of this article~~ **April 13, 1996** or the anniversary date of the approved closure plans, whichever is earlier.

(c) The closure plan must identify the steps necessary to completely close the MSWLF at any point during its active life in accordance with section 1 of this rule. The plan must be certified by a registered professional engineer. The closure plan must include the following:

- (1) A description of the steps that will be used to partially close, if applicable, and finally close the MSWLF in accordance with section 1 of this rule.

necessary to close the MSWLF.

(3) An estimate of the expected year of closure and a schedule for final closure. The schedule must include the following:

(A) The total time required to close the MSWLF.

(B) The time required for completion of intervening closure activities.

(4) An estimate of the maximum inventory of wastes that will be on-site over the active life of the MSWLF.

(5) An estimate of the cost per acre of providing final cover and vegetation. Such cost must reflect cost necessary to close the MSWLF by the third party as required by the approved plan, but must not be less than:

(A) ~~twenty~~ **twenty-one** thousand dollars ~~(\$20,000)~~ **(\$21,000)** per acre to close MSWLF units that are constructed with only a soil liner; and

(B) ~~seventy-five~~ **seventy-eight** thousand ~~seven~~ **hundred fifty** dollars ~~(\$75,000)~~ **(\$78,750)** per acre for MSWLF units that are constructed with a composite bottom liner system.

Existing closure plan cost estimates approved before the latest effective date of this section are not required to be revised by the owner, operator, or permittee to meet the minimum cost estimates given in clauses (A) and (B). The minimum cost estimates given in clauses (A) and (B) are valid for one (1) year after the latest effective date of this section. If an application is submitted for a new MSWLF or a major modification one (1) year after the latest effective date of this section, the owner, operator, or permittee must adjust these cost estimates for inflation as described in 329 IAC 10-39-2(c)(1).

(6) **For major modifications**, the closure cost estimate must include a ten percent (10%) contingency cost on the total closure cost of the MSWLF.

(7) If the owner, operator, or permittee of an MSWLF utilizes the **incremental** closure ~~trust fund option or funds the letter of credit on an annual basis; standard~~, as contained in ~~329 IAC 10-39-~~ **329 IAC 10-39-2(b)(3)(B)**, then for each yearly period following the beginning of operation of the MSWLF, the closure plan must specify the maximum area of the MSWLF into which municipal solid waste will have been deposited through that year of the MSWLF's life and must delineate such areas on the copy of the facility's

(2) A listing of labor, materials, and testing necessary to close the MSWLF.

(3) An estimate of the expected year of closure and a schedule for final closure. The schedule must include the following:

(A) The total time required to close the MSWLF.

(B) The time required for completion of intervening closure activities.

(4) An estimate of the maximum inventory of wastes that will be on-site over the active life of the MSWLF.

(5) An estimate of the cost per acre of providing final cover and vegetation. Such cost must reflect cost necessary to close the MSWLF by the third party as required by the approved plan, but must not be less than:

(A) ~~twenty~~ **twenty-one** thousand dollars ~~(\$20,000)~~ **(\$21,000)** per acre to close MSWLF units that are constructed with only a soil liner; and

(B) ~~seventy-five~~ **seventy-eight** thousand ~~seven~~ **hundred fifty** dollars ~~(\$75,000)~~ **(\$78,750)** per acre for MSWLF units that are constructed with a composite bottom liner system.

For an application for a new MSWLF or a major modification submitted on or after January 1, 2005, the owner, operator, or permittee must adjust the minimum closure costs provided in clauses (A) and (B) for inflation, as described in 329 IAC 10-39-2(c)(1).

(6) **For new MSWLFs and major modifications**, the closure cost estimate must include a ten percent (10%) contingency cost on the total closure cost of the MSWLF.

(7) If the owner, operator, or permittee of an MSWLF utilizes the **incremental** closure ~~trust fund option or funds the letter of credit on an annual basis; standard~~, as contained in ~~329 IAC 10-39-~~ **329 IAC 10-39-2(b)(3)(B)**, then for each yearly period following the beginning of operation of the MSWLF, the closure plan must specify the maximum area of the MSWLF into which municipal solid waste will have been deposited through that year of the MSWLF's life and must delineate such areas on the copy of the facility's final contour map. The closure plan must list closure cost estimates for each year of the anticipated life of the facility equal to the costs specified by subdivisions (5) and (6).

(8) An estimate of the yearly maintenance costs for a dike or dikes required under 329 IAC 10-16-2.

final contour map. The closure plan must list closure cost estimates for each year of the anticipated life of the facility equal to the costs specified by subdivisions (5) and (6).

(8) An estimate of the yearly maintenance costs for a dike or dikes required under 329 IAC 10-16-2.

(9) A construction quality assurance and construction quality control plan for the construction and installation of the final cover system as required by this rule.

(10) A description of the final cover, designed in accordance with this rule, and the methods and procedures to be used to install the cover.

(11) An estimate of the largest area of the MSWLF ever requiring a final cover as required under this rule at any time during the active life.

(12) If property is used to fulfill or reduce the cost of closure funding, the property must not be sold, relinquished, or used for any other purpose. If the property is proposed to be sold, relinquished, or used for any other purpose, the owner, operator, or permittee shall complete the following requirements:

(A) The closure plan must be updated under this section and submitted to the commissioner.

(B) The closure financial responsibility must be updated under 329 IAC 10-39 and submitted to the commissioner.

(C) The owner, operator, or permittee shall receive approval from the commissioner for the requirements under clauses (A) and (B) prior to selling, relinquishing, or using the property for any other purpose.

329 IAC 10-22-3 Partial closure certification

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 3. (a) The owner, operator, or permittee of an MSWLF may submit partial closure certification for portions of the MSWLF that have received final cover and are graded and have established vegetation in accordance with the applicable provisions of this rule, 329 IAC 10-20, and the approved closure plan prior to closure of the MSWLF.

(b) The owner, operator, or permittee of an MSWLF shall submit to the commissioner a certification signed by the owner, operator, or permittee and an independent registered professional engineer that specifically identifies the closed areas and that specifies that the partial closure has been accomplished in accordance with the approved closure plan and this article. Certification of partial closure

(9) A construction quality assurance and construction quality control plan for the construction and installation of the final cover system as required by this rule.

(10) A description of the final cover, designed in accordance with this rule, and the methods and procedures to be used to install the cover.

(11) An estimate of the largest area of the MSWLF ever requiring a final cover as required under this rule at any time during the active life.

(12) If property is used to fulfill or reduce the cost of closure funding, the property must not be sold, relinquished, or used for any other purpose. If the property is proposed to be sold, relinquished, or used for any other purpose, the owner, operator, or permittee shall complete the following requirements:

(A) The closure plan must be updated under this section and submitted to the commissioner.

(B) The closure financial responsibility must be updated under 329 IAC 10-39 and submitted to the commissioner.

(C) The owner, operator, or permittee shall receive approval from the commissioner for the requirements under clauses (A) and (B) prior to selling, relinquishing, or using the property for any other purpose.

329 IAC 10-22-3 Partial closure certification

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 3. (a) The owner, operator, or permittee of an MSWLF may submit partial closure certification for portions of the MSWLF that have received final cover and are graded and have established vegetation in accordance with the applicable provisions of this rule, 329 IAC 10-20, and the approved closure plan prior to closure of the MSWLF.

(b) The owner, operator, or permittee of an MSWLF shall submit to the commissioner a certification signed by the owner, operator, or permittee and an independent registered professional engineer that specifically identifies the closed areas and that specifies that the partial closure has been accomplished in accordance with the approved closure plan and this article. Certification of partial closure must not be

must not be made for an area until the final cover has been completely provided for that area and vegetation has been established.

(c) The partial closure certification will be deemed adequate unless, within ~~one hundred fifty (150)~~ **ninety (90)** days of receipt of the partial closure certification, the commissioner issues a notice of deficiency of closure, including action necessary to correct the deficiency.

(d) A partial closure for leachate generation rate, as required by 329 IAC 10-23-3(c)(5)(B), may be granted if the owner, operator, or permittee of an MSWLF provides actual leachate generation rate data of an area for at least a two (2) year duration after final cover is installed and certified.

(e) Fifteen (15) days prior to initiation of partial closure of a certain area, the owner, operator, or permittee of an MSWLF shall notify the commissioner in writing that they will be constructing a final cover.

329 IAC 10-22-7 Final cover requirements for existing MSWLF units constructed without a composite bottom liner

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 7. (a) The owner, operator, or permittee of an MSWLF containing existing MSWLF units constructed without a composite bottom liner shall install a final cover system as appropriate to subsection (b) or (c) within one hundred eighty (180) days on any area in the MSWLF units **as approved in the closure plan** that:

- (1) has received the final waste volume; or
- (2) is filled to the approved final waste elevation; unless otherwise approved by the commissioner or as approved under section 5(b) of this rule.

(b) Unless otherwise approved by the commissioner, final cover systems for existing MSWLF units constructed with a soil bottom liner and a leachate collection system that were permitted under 329 IAC 2, which was repealed in 1996, and closing after January 1, 1998, must consist of the following:

- (1) On slopes equal to or less than fifteen percent (15%) or eight and fifty-three hundredths (8.53) degrees, the final cover must be constructed as follows:

- (A) A twenty-four (24) inch barrier layer of soil of the Unified Soil Classification ML, CL, MH, CH, or OH directly over the waste.

made for an area until the final cover has been completely provided for that area and vegetation has been established.

(c) The partial closure certification will be deemed adequate unless, within ~~one hundred fifty (150)~~ **ninety (90)** days of receipt of the partial closure certification, the commissioner issues a notice of deficiency of closure, including action necessary to correct the deficiency.

(d) A partial closure for leachate generation rate, as specified in 329 IAC 10-23-3(c)(5)(B), may be granted if the owner, operator, or permittee of an MSWLF provides actual leachate generation rate data of an area for at least a two (2) year duration after final cover is installed and certified.

(e) Fifteen (15) days prior to initiation of partial closure of a certain area, the owner, operator, or permittee of an MSWLF shall notify the commissioner in writing that they will be constructing a final cover.

329 IAC 10-22-7 Final cover requirements for existing MSWLF units constructed without a composite bottom liner

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3
Affected: IC 13-20; IC 36-9-30

Sec. 7. (a) The owner, operator, or permittee of an MSWLF containing existing MSWLF units constructed without a composite bottom liner shall install a final cover system as appropriate to subsection (b) or (c) within one hundred eighty (180) days on any area in the MSWLF units **as approved in the closure plan** that:

- (1) has received the final waste volume; or
- (2) is filled to the approved final waste elevation; ~~unless otherwise approved by the commissioner~~ or as approved under section 5(b) of this rule.

(b) Unless otherwise approved by the commissioner **based on a final cover system providing equivalent environmental protection**, final cover systems for existing MSWLF units constructed with a soil bottom liner and a leachate collection system that were permitted under 329 IAC 2, which was repealed in 1996, and closing after January 1, 1998, must consist of the following:

- (1) On slopes equal to or less than fifteen percent (15%) or eight and fifty-three hundredths (8.53) degrees, the final cover must be constructed as follows:

Other suitable material approved by the commissioner may be used if it provides an adequate level of protection to human health ~~and or~~ the environment. The soil must be compacted to achieve a hydraulic conductivity equal to 1×10^{-7} centimeters per second or less. Grain size, Atterberg limits, and hydraulic conductivity tests as approved by the commissioner or as required by this article must be performed to confirm the quality of the final cover.

(B) A vegetative layer must overlay the top protective layer. This layer must consist of at least six (6) inches of earthen material capable of sustaining vegetation.

(2) On slopes greater than fifteen percent (15%) or eight and fifty-three hundredths (8.53) degrees, the final cover must be constructed as follows:

(A) A twenty-four (24) inch barrier layer of soil of the Unified Soil Classification ML, CL, MH, CH, or OH directly over the waste. Other suitable material approved by the commissioner may be used if it provides an adequate level of protection to human health ~~and or~~ the environment. The soil must be compacted to achieve a hydraulic conductivity equal to 1×10^{-6} centimeters per second or less. Grain size, Atterberg limits, and hydraulic conductivity tests as approved by the commissioner or as required by this article must be performed to confirm the quality of the final cover.

(B) A vegetative layer consisting of at least six (6) inches of earthen material capable of sustaining vegetation must overlay the barrier layer.

(C) An increase in the thickness of the layers required in this subdivision may be required by the facility permit or the commissioner.

(3) The maximum projected erosion rate of the final cover must be no more than five (5) tons per acre per year.

(4) The final cover must have a slope:

(A) no less than four percent (4%) or two and twenty-nine hundredths (2.29) degrees; and

(B) no greater than thirty-three percent (33%) or eighteen and twenty-six hundredths (18.26) degrees.

(c) Unless otherwise approved by the commissioner, final cover systems for existing MSWLF units constructed without a soil bottom liner

(A) A twenty-four (24) inch barrier layer of soil of the Unified Soil Classification ML, CL, MH, CH, or OH directly over the waste.

Other suitable material approved by the commissioner may be used if it provides an adequate level of protection to human health and the environment. The soil must be compacted to achieve a hydraulic conductivity equal to 1×10^{-7} centimeters per second or less. Grain size, Atterberg limits, and hydraulic conductivity tests as approved by the commissioner or as required by this article must be performed to confirm the quality of the final cover.

(B) A vegetative layer must overlay the top protective layer. This layer must consist of at least six (6) inches of earthen material capable of sustaining vegetation.

(2) On slopes greater than fifteen percent (15%) or eight and fifty-three hundredths (8.53) degrees, the final cover must be constructed as follows:

(A) A twenty-four (24) inch barrier layer of soil of the Unified Soil Classification ML, CL, MH, CH, or OH directly over the waste. Other suitable material approved by the commissioner may be used if it provides an adequate level of protection to human health and the environment. The soil must be compacted to achieve a hydraulic conductivity equal to 1×10^{-6} centimeters per second or less. Grain size, Atterberg limits, and hydraulic conductivity tests as approved by the commissioner or as required by this article must be performed to confirm the quality of the final cover.

(B) A vegetative layer consisting of at least six (6) inches of earthen material capable of sustaining vegetation must overlay the barrier layer.

(C) An increase in the thickness of the layers required in this subdivision may be required by the facility permit or the commissioner.

(3) The maximum projected erosion rate of the final cover must be no more than five (5) tons per acre per year.

(4) The final cover must have a slope:

(A) no less than four percent (4%) or two and twenty-nine hundredths (2.29) degrees; and

(B) no greater than thirty-three percent (33%) or eighteen and twenty-six hundredths (18.26) degrees.

or a leachate collection system that were permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, and closing after January 1, 1998, must consist of the following:

- (1) On slopes equal to or less than fifteen percent (15%) or eight and fifty-three hundredths (8.53) degrees, the final cover not including benches, swales, and drainage features, must be constructed as specified in section 6(b)(1) through 6(b)(7) of this rule.
- (2) On slopes greater than fifteen percent (15%) or eight and fifty-three hundredths (8.53) degrees, the final cover must be constructed as specified in subsection (b)(2).
- (3) The maximum projected erosion rate of the final cover must be no more than five (5) tons per acre per year.
- (4) The final cover must have a slope:
 - (A) not less than four percent (4%) or two and twenty-nine hundredths (2.29) degrees; and
 - (B) not greater than thirty-three percent (33%) or eighteen and twenty-six hundredths (18.26) degrees.

329 IAC 10-23-2 Post-closure duties

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 2. (a) The owner, operator, or permittee of an MSWLF has the following duties after closure:

- (1) Post-closure activities must be performed in accordance with the approved post-closure plan as specified in section 3 of this rule.
- (2) Inspection of the MSWLF at least twice per year with a written report on the condition of the MSWLF to be submitted to the commissioner.
- (3) Maintenance of the integrity of the geomembrane cap, if applicable, and the minimum thickness of final cover and vegetation as required by 329 IAC 10-20 and 329 IAC 10-22 or as approved by the commissioner.
- (4) Maintenance of the final contours of the MSWLF in accordance with the applicable standards of 329 IAC 10-20 and 329 IAC 10-22 and, at a minimum, to provide that no ponding of water occurs on filled areas.
- (5) Control of any vegetation on vehicular access ways to monitoring wells as required by 329 IAC 10-20-2(d).

(c) Unless otherwise approved by the commissioner **based on a final cover system providing equivalent environmental protection**, final cover systems for existing MSWLF units constructed without a soil bottom liner or a leachate collection system that were permitted under 329 IAC 1.5, which was repealed in 1989, or 329 IAC 2, which was repealed in 1996, and closing after January 1, 1998, must consist of the following:

- (1) On slopes equal to or less than fifteen percent (15%) or eight and fifty-three hundredths (8.53) degrees, the final cover not including benches, swales, and drainage features, must be constructed as specified in section 6(b)(1) through 6(b)(7) of this rule.
- (2) On slopes greater than fifteen percent (15%) or eight and fifty-three hundredths (8.53) degrees, the final cover must be constructed as specified in subsection (b)(2).
- (3) The maximum projected erosion rate of the final cover must be no more than five (5) tons per acre per year.
- (4) The final cover must have a slope:
 - (A) not less than four percent (4%) or two and twenty-nine hundredths (2.29) degrees; and
 - (B) not greater than thirty-three percent (33%) or eighteen and twenty-six hundredths (18.26) degrees.

329 IAC 10-23-2 Post-closure duties

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 2. (a) The owner, operator, or permittee of an MSWLF has the following duties after closure:

- (1) Post-closure activities must be performed in accordance with the approved post-closure plan as specified in section 3 of this rule.
- (2) Inspection of the MSWLF at least twice per year with a written report on the condition of the MSWLF to be submitted to the commissioner.
- (3) Maintenance of the integrity of the geomembrane cap, if applicable, and the minimum thickness of final cover and vegetation as required by 329 IAC 10-20 and 329 IAC 10-22 or as approved by the commissioner.
- (4) Maintenance of the final contours of the MSWLF in accordance with the applicable standards of 329 IAC 10-20 and 329 IAC 10-22 and, at a minimum, to provide that no ponding of water occurs on filled areas.
- (5) Control of any vegetation on vehicular access ways to monitoring wells as required by 329 IAC 10-20-2(d).

- (6) Control of vegetation at the MSWLF as necessary to enable determination of the need for slope and cover maintenance and leachate outbreak abatement.
- (7) Maintenance of access control and benchmarks at the MSWLF.
- (8) Maintenance and monitoring of the dike or dikes required under 329 IAC 10-16-2.
- (9) If ownership of the land or MSWLF changes at any time during the post-closure period, the new owner must have a written agreement with the past owner which states the new owner will monitor and maintain the dike or dikes required by 329 IAC 10-16-2 during the subsequent post-closure period.
- (10) Maintenance and monitoring of leachate collection and treatment systems and methane control systems.
- (11) Control of any leachate or gas generated at the MSWLF as required by 329 IAC 10-20.
- (12) Erosion and sediment control measures must be instituted to comply with 329 IAC 10-20-12.
- (13) An MSWLF that closes:
 - (A) prior to the effective date required by 40 CFR 258 for the MSWLF units' ground water monitoring, must continue to monitor ground water as required by the rules in force at the time the facility entered into post-closure;
 - (B) on or after the effective date required by 40 CFR 258 for the MSWLF units' ground water monitoring, must monitor ground water after the effective date of this article as required by 329 IAC 10-21; or
 - (C) under any other article is required to follow the:
 - (i) post-closure plan as required by the rules in force at the time the MSWLF entered into post-closure; or
 - (ii) rules in force at the time the MSWLF entered into post-closure if the rules in force do not require a post-closure plan.
- (14) In addition to the corrective action program required by the rules under which the facility closed, the commissioner may require performance of corrective action measures within 329 IAC 10-21-13 if the MSWLF:
 - (A) closed prior to the effective date of this article;
 - (B) is monitoring ground water in accordance with the rules in force at the time the MSWLF entered into post-closure; and

- (6) Control of vegetation at the MSWLF as necessary to enable determination of the need for slope and cover maintenance and leachate outbreak abatement.
- (7) Maintenance of access control and benchmarks at the MSWLF.
- (8) Maintenance and monitoring of the dike or dikes required under 329 IAC 10-16-2.
- (9) If ownership of the land or MSWLF changes at any time during the post-closure period, the new owner must have a written agreement with the past owner which states the new owner will monitor and maintain the dike or dikes required by 329 IAC 10-16-2 during the subsequent post-closure period.
- (10) Maintenance and monitoring of leachate collection and treatment systems and methane control systems.
- (11) Control of any leachate or gas generated at the MSWLF as required by 329 IAC 10-20.
- (12) Erosion and sediment control measures must be instituted to comply with 329 IAC 10-20-12.
- (13) An MSWLF that closes:
 - (A) prior to the effective date required by 40 CFR 258 for the MSWLF units' ground water monitoring, must continue to monitor ground water as required by the rules in force at the time the facility entered into post-closure;
 - (B) on or after the effective date required by 40 CFR 258 for the MSWLF units' ground water monitoring, must monitor ground water after ~~the effective date of this article~~ **April 13, 1996**, as required by 329 IAC 10-21; or
 - (C) under any other article is required to follow the:
 - (i) post-closure plan as required by the rules in force at the time the MSWLF entered into post-closure; or
 - (ii) rules in force at the time the MSWLF entered into post-closure if the rules in force do not require a post-closure plan.
- (14) In addition to the corrective action program required by the rules under which the facility closed, the commissioner may require performance of corrective action measures within 329 IAC 10-21-13 if the MSWLF:
 - (A) closed prior to ~~the effective date of this article~~ **April 13, 1996**;
 - (B) is monitoring ground water in accordance with the rules in force at the time the MSWLF entered into post-closure; and
 - (C) finds a corrective action program is applicable under the rules in force at the time the MSWLF entered post-closure.

(C) finds a corrective action program is applicable under the rules in force at the time the MSWLF entered post-closure.

(b) Post-closure requirements imposed by this section must be followed for a period of thirty (30) years after the following applicable date:

(1) If the final closure certification is deemed adequate, the date the final closure certification is received by the commissioner in accordance with 329 IAC 10-22-8(a).

(2) If the final closure certification is deemed inadequate, the date the commissioner approves any actions necessary to correct items listed in a notice of deficiency of closure certification under 329 IAC 10-22-8(c).

(c) The length of the post-closure care period may be increased by the commissioner if the commissioner determines that the lengthened period is necessary to protect human health ~~and~~ **or** the environment. The standards to determine an increased post-closure care period include, but are not limited to:

- (1) stability of final cover;
- (2) maintenance problems with an MSWLF certified as closed;
- (3) evidence of ground water contamination;
- (4) quantity of gas produced and managed; or
- (5) reliability of ground water monitoring well system.

329 IAC 10-23-3 Post-closure plan

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 3. (a) The owner, operator, or permittee of an MSWLF shall have a written post-closure plan. The post-closure plan must be submitted with the permit application in accordance with 329 IAC 10-11 and be approved by the commissioner. The approved post-closure plan must become a condition of the permit. If the permit expires or is revoked, the post-closure plan remains effective and enforceable during the post-closure period. If the plan is determined to be unacceptable, the commissioner shall identify the items needed to make it complete.

(b) The owner, operator, or permittee of existing MSWLFs shall revise and submit post-closure plans meeting the requirements of this rule within six (6) months after the effective date of this article or the anniversary date of the approved post-closure plan, whichever is earlier.

(b) Post-closure requirements imposed by this section must be followed for a period of thirty (30) years after the following applicable date:

(1) If the final closure certification is deemed adequate, the date the final closure certification is received by the commissioner in accordance with 329 IAC 10-22-8(a).

(2) If the final closure certification is deemed inadequate, the date the commissioner approves any actions necessary to correct items listed in a notice of deficiency of closure certification under 329 IAC 10-22-8(c).

(c) The length of the post-closure care period may be increased by the commissioner if the commissioner determines that the lengthened period is necessary to protect human health ~~and~~ **or** the environment. The standards to determine an increased post-closure care period include, but are not limited to:

- (1) stability of final cover;
- (2) maintenance problems with an MSWLF certified as closed;
- (3) evidence of ground water contamination;
- (4) quantity of gas produced and managed; or
- (5) reliability of ground water monitoring well system.

329 IAC 10-23-3 Post-closure plan

Authority: IC 13-14-8-7; IC 13-15; IC 13-19-3

Affected: IC 13-20; IC 36-9-30

Sec. 3. (a) The owner, operator, or permittee of an MSWLF shall have a written post-closure plan. The post-closure plan must be submitted with the permit application in accordance with 329 IAC 10-11 and be approved by the commissioner. The approved post-closure plan must become a condition of the permit. If the permit expires or is revoked, the post-closure plan remains effective and enforceable during the post-closure period. If the plan is determined to be unacceptable, the commissioner shall identify the items needed to make it complete.

(b) The owner, operator, or permittee of existing MSWLFs shall revise and submit post-closure plans meeting the requirements of this rule within six (6) months after ~~the effective date of this article~~ **April 13, 1996**, or the anniversary date of the approved post-closure plan, whichever is earlier.

(c) The post-closure plan must identify the activities that will be carried on after closure under section 2 of this rule and must include at least the following:

- (1) A description of the planned ground water monitoring activities and the frequency at which they will be performed.
- (2) A description of the planned maintenance activities and the frequency at which they will be performed.
- (3) A description of the planned uses of the property during the post-closure period. Post-closure use of the property must not disturb the integrity of the final cover, liner, or any other component of the containment system, or the function of the monitoring system, unless necessary to comply with this article. The commissioner may approve other disturbances if the owner, operator, or permittee demonstrates that disturbance of the final cover, liner, or other component of the containment system, including any removal of waste, will not increase the potential threat to human health or the environment.
- (4) The name, address, and telephone number of the owner, operator, or permittee with responsibility for maintaining the site after closure whom the commissioner may contact about the MSWLF during the post-closure period.
- (5) A post-closure cost estimate in accordance with 329 IAC 10-39. Post-closure costs must be calculated based on the cost necessary for the work to be performed by a third party for thirty (30) years of the post-closure period and must include the following:

- (A) For post-closure maintenance of final cover and vegetation, the amount per acre must be ten percent (10%) of the cost calculated under 329 IAC 10-22-2(c)(5) multiplied by the total acreage of the site permitted for filling.
- (B) At a minimum, the amount of funds necessary for leachate treatment and disposal must be based on the following gallons per acre per day over the thirty (30) year post-closure period:

Year	Gallons Per Acre Per Day (GPAD)
1-5	150
6-10	80
11-15	50
16-20	30

(c) The post-closure plan must identify the activities that will be carried on after closure under section 2 of this rule and must include at least the following:

- (1) A description of the planned ground water monitoring activities and the frequency at which they will be performed.
- (2) A description of the planned maintenance activities and the frequency at which they will be performed.
- (3) A description of the planned uses of the property during the post-closure period. Post-closure use of the property must not disturb the integrity of the final cover, liner, or any other component of the containment system, or the function of the monitoring system, unless necessary to comply with this article. The commissioner may approve other disturbances if the owner, operator, or permittee demonstrates that disturbance of the final cover, liner, or other component of the containment system, including any removal of waste, will not increase the potential threat to human health or the environment.
- (4) The name, address, and telephone number of the owner, operator, or permittee with responsibility for maintaining the site after closure whom the commissioner may contact about the MSWLF during the post-closure period.
- (5) A post-closure cost estimate in accordance with 329 IAC 10-39. Post-closure costs must be calculated based on the cost necessary for the work to be performed by a third party for thirty (30) years of the post-closure period and must include the following:

- (A) For post-closure maintenance of final cover and vegetation, the amount per acre must be ten percent (10%) of the cost calculated under 329 IAC 10-22-2(c)(5) multiplied by the total acreage of the site permitted for filling.
- (B) At a minimum, the amount of funds necessary for leachate treatment and disposal must be based on the following gallons per acre per day over the thirty (30) year post-closure period:

Year	Gallons Per Acre Per Day (GPAD)
1-5	150
6-10	80
11-15	50
16-20	30
21-25	20
26-30	10

21–25 20
26–30 10

The commissioner may increase or decrease this amount of funding if it is determined that, based on a site-specific basis, more or less funds are necessary. **A partial closure for leachate generation rate, as required by 329 IAC 10-22-3(d), may be granted, if the owner, operator, or permittee of an MSWLF provides actual leachate generation rate data of an area for at least a two (2) years duration after final cover is installed and certified.**

(C) At a minimum, the amount of funds necessary to provide for post-closure activities must include funds for the following:

- (i) Ground water monitoring and well maintenance, **including piezometers when applicable.**
- (ii) Methane monitoring and maintenance.
- (iii) Maintenance of drainage and erosion control system.
- (iv) Maintenance of leachate collection system.
- (v) Maintenance of access control.
- (vi) Control of vegetation.
- (vii) Maintenance of the dike or dikes if required under 329 IAC 10-16-2.

(6) The post-closure cost estimate must include a twenty-five percent (25%) contingency cost based on total post-closure cost.

(7) If the property is used to fulfill or reduce the cost of post-closure funding, the property must not be sold, relinquished, or used for any other purpose. If the property is proposed to be sold, relinquished, or used for any other purpose, the owner, operator, or permittee shall complete the following requirements:

- (A) The post-closure plan must be updated under this section and submitted to the commissioner.
- (B) The post-closure financial responsibility must be updated under 329 IAC 10-39 and submitted to the commissioner.
- (C) The owner, operator, or permittee shall receive approval from the commissioner for the requirements under clauses (A) and (B) prior to selling, relinquishing, or using the property for any other purpose.

(d) Proposed changes to the approved post-closure

The commissioner may increase or decrease this amount of funding if it is determined that, based on a site-specific basis, more or less funds are necessary. **A partial closure for leachate generation rate, based on the rates described in this clause, may be granted, if the owner, operator, or permittee of an MSWLF provides actual leachate generation rate data of an area for at least a two (2) years duration after final cover is installed and certified.**

(C) At a minimum, the amount of funds necessary to provide for post-closure activities must include funds for the following:

- (i) Ground water monitoring and well maintenance, **including piezometers when applicable.**
- (ii) Methane monitoring and maintenance.
- (iii) Maintenance of drainage and erosion control system.
- (iv) Maintenance of leachate collection system.
- (v) Maintenance of access control.
- (vi) Control of vegetation.
- (vii) Maintenance of the dike or dikes if required under 329 IAC 10-16-2.

(6) The post-closure cost estimate must include a twenty-five percent (25%) contingency cost based on total post-closure cost.

(7) If the property is used to fulfill or reduce the cost of post-closure funding, the property must not be sold, relinquished, or used for any other purpose. If the property is proposed to be sold, relinquished, or used for any other purpose, the owner, operator, or permittee shall complete the following requirements:

- (A) The post-closure plan must be updated under this section and submitted to the commissioner.
- (B) The post-closure financial responsibility must be updated under 329 IAC 10-39 and submitted to the commissioner.
- (C) The owner, operator, or permittee shall receive approval from the commissioner for the requirements under clauses (A) and (B) prior to selling, relinquishing, or using the property for any other purpose.

(d) Proposed changes to the approved post-closure plans may be submitted to the commissioner during the post-closure period. The commissioner shall provide notification that the modification is not acceptable within sixty (60) days of receiving the modification request. If the owner or operator does not receive

plans may be submitted to the commissioner during the post-closure period. The commissioner shall provide notification that the modification is not acceptable within sixty (60) days of receiving the modification request. If the owner or operator does not receive notification from the commissioner within sixty (60) days, the post-closure plan modifications may be installed in accordance with documentation provided to the commissioner.

329 IAC 10-29-1 Monitoring devices

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 1. (a) All new restricted waste sites Type I and Type II and nonmunicipal solid waste landfills must have ground water monitoring devices. All existing nonmunicipal solid waste landfills in operation on the effective date of 329 IAC 2, which was repealed in 1996, that do not have ground water monitoring devices must install such devices on or before September 1, 1989.

(b) The number and location of monitoring devices are as follows:

(1) The following for new facilities:

- (A) The ground water monitoring system must consist of a sufficient number of monitoring devices, installed at appropriate locations and depths, to yield ground water samples from the aquifer or aquifers that represent the quality of both background water that has not been affected by leachate from a facility and the quality of ground water passing the monitoring boundary of the facility. If the aquifer to be monitored exceeds the depth specified in 329 IAC 10-24-3(1)(C), the commissioner may allow alternative placement of monitoring devices.
- (B) The number, spacing, and depths of monitoring devices must be proposed by the applicant in the site-specific geological study required under 329 IAC 10-24.
- (C) A minimum of four (4) ground water monitoring devices, one (1) upgradient and three (3) downgradient, must be installed.

(2) For existing facilities under subsection (a), as follows:

- (A) A minimum of four (4) ground water monitoring devices, one (1) upgradient and three (3) downgradient, must be installed at facilities that do not have an existing ground water monitoring system that meets the requirements of the commissioner.

notification from the commissioner within sixty (60) days, the post-closure plan modifications may be installed in accordance with documentation provided to the commissioner.

329 IAC 10-29-1 Monitoring devices

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 1. (a) All new restricted waste sites Type I and Type II and nonmunicipal solid waste landfills must have ground water monitoring devices. All existing nonmunicipal solid waste landfills in operation on the effective date of 329 IAC 2, which was repealed in 1996, that do not have ground water monitoring devices must install such devices on or before September 1, 1989.

(b) The number and location of monitoring devices are as follows:

(1) The following for new facilities:

- (A) The ground water monitoring system must consist of a sufficient number of monitoring devices, installed at appropriate locations and depths, to yield ground water samples from the aquifer or aquifers that represent the quality of both background water that has not been affected by leachate from a facility and the quality of ground water passing the monitoring boundary of the facility. If the aquifer to be monitored exceeds the depth specified in 329 IAC 10-24-3(1)(C), the commissioner may allow alternative placement of monitoring devices.
- (B) The number, spacing, and depths of monitoring devices must be proposed by the applicant in the site-specific geological study required under 329 IAC 10-24.
- (C) A minimum of four (4) ground water monitoring devices, one (1) upgradient and three (3) downgradient, must be installed.

(2) For existing facilities under subsection (a), as follows:

- (A) A minimum of four (4) ground water monitoring devices, one (1) upgradient and three (3) downgradient, must be installed at facilities that do not have an existing ground water monitoring system that meets the requirements of the commissioner.

(B) Locations and installation of monitoring devices must be in accordance with a plan submitted to and approved by the commissioner.

(c) The commissioner may request notification in advance of the date and time of the installation of the monitoring devices.

(d) The owner or operator of a restricted waste site Type I or Type II or nonmunicipal solid waste landfill shall prepare and submit to the commissioner at least annually a ground water flow map or maps as necessary to indicate seasonal ground water. If data acquired during operation of the facility indicates that ground water flow directions are other than as anticipated in the ground water monitoring system design, the commissioner may require additional **ground water** monitoring wells at the facility.

(e) If for any reason a **ground water** monitoring well or other monitoring device is destroyed or otherwise fails to properly function, the owner or operator of a restricted waste site Type I or Type II or nonmunicipal solid waste landfill shall notify the commissioner within ten (10) days of discovery. The device must be repaired if possible. If the device cannot be repaired, it must be properly abandoned and replaced within sixty (60) days of the notification unless the owner or operator is notified otherwise in writing by the commissioner.

(f) As used in this rule, "monitoring devices" includes the following:

- (1) Ground water monitoring wells.
- (2) Suction lysimeters.
- (3) Moisture probes.
- (4) Similar monitoring devices.

(g) As used in this rule, "monitoring boundary of the facility" means the vertical plane provided by the monitoring devices hydraulically downgradient from the facility. The downgradient monitoring devices that constitute the monitoring boundary of the facility must be located within fifty (50) feet of the solid waste boundary or the property line, whichever is closer to the solid waste boundary, except where fifty (50) feet is not possible because of site topography or geology. In the case of existing facilities that have ground water monitoring devices approved by the commissioner prior to the effective date of this article, those approved devices must define the monitoring boundary of the facility.

(B) Locations and installation of monitoring devices must be in accordance with a plan submitted to and approved by the commissioner.

(c) The commissioner may request notification in advance of the date and time of the installation of the monitoring devices.

(d) The owner or operator of a restricted waste site Type I or Type II or nonmunicipal solid waste landfill shall prepare and submit to the commissioner at least annually a ground water flow map or maps as necessary to indicate seasonal ground water. If data acquired during operation of the facility indicates that ground water flow directions are other than as anticipated in the ground water monitoring system design, the commissioner may require additional **ground water** monitoring wells at the facility.

(e) If for any reason a **ground water** monitoring well or other monitoring device is destroyed or otherwise fails to properly function, the owner or operator of a restricted waste site Type I or Type II or nonmunicipal solid waste landfill shall notify the commissioner within ten (10) days of discovery. The device must be repaired if possible. If the device cannot be repaired, it must be properly abandoned and replaced within sixty (60) days of the notification unless the owner or operator is notified otherwise in writing by the commissioner.

(f) As used in this rule, "monitoring devices" includes the following:

- (1) Ground water monitoring wells.
- (2) Suction lysimeters.
- (3) Moisture probes.
- (4) Similar monitoring devices.

(g) As used in this rule, "monitoring boundary of the facility" means the vertical plane provided by the monitoring devices hydraulically downgradient from the facility. The downgradient monitoring devices that constitute the monitoring boundary of the facility must be located within fifty (50) feet of the solid waste boundary or the property line, whichever is closer to the solid waste boundary, except where fifty (50) feet is not possible because of site topography or geology. In the case of existing facilities that have ground water monitoring devices approved by the commissioner prior to ~~the effective date of this article~~ **April 13, 1996**, those approved devices must define the monitoring boundary of the facility.

329 IAC 10-39-1 Applicability

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 1. (a) This rule applies to all solid waste land disposal facilities that:

- (1) are required to have a permit by 329 IAC 10-11-1; and
- (2) apply for a permit after the promulgation of this rule or have an operating permit in effect on the effective date of this article.

(b) The permittee for solid waste land disposal facilities regulated by this rule shall provide financial responsibility for closure and post-closure in accordance with the following:

- (1) Closure and post-closure rules, including:
 - (A) 329 IAC 10-22 and 329 IAC 10-23;
 - (B) 329 IAC 10-30 and 329 IAC 10-31; or
 - (C) 329 IAC 10-37 and 329 IAC 10-38.
- (2) Sections 2 through 5 of this rule.

(c) Solid waste land disposal facilities that have operating permits in effect must not continue to operate unless they have established financial responsibility for post-closure by choosing a financial assurance mechanism under section 3(a) of this rule and by funding the same under section 3(b) of this rule.

(d) Solid waste land disposal facilities that have operating permits in effect must not continue to operate unless they have established financial responsibility for closure by choosing a financial assurance mechanism under section 2(a) of this rule and by funding the same under section 2(b) of this rule.

(e) Solid waste land disposal facilities that apply for permits after the promulgation of this rule must provide financial responsibility as required by ~~329 IAC 10-11-2(b)(12)~~. **329 IAC 10-11-2.5(a)(4)**. The documents establishing both the closure and post-closure financial responsibility must be executed by and approved by the commissioner prior to operation of the facility. In addition, the financial assurance mechanism must be funded under sections 2(b) and 3(b) of this rule prior to operation.

329 IAC 10-39-1 Applicability

Authority: IC 13-14-8-7; IC 13-15-2-1; IC 13-19-3-1
Affected: IC 13-30-2; IC 36-9-30

Sec. 1. (a) This rule applies to all solid waste land disposal facilities that:

- (1) are required to have a permit by 329 IAC 10-11-1; and
- (2) apply for a permit after **April 13, 1996** ~~the promulgation of this rule~~ or have an operating permit in effect on ~~the effective date of this article~~ **April 13, 1996**.

(b) The permittee for solid waste land disposal facilities regulated by this rule shall provide financial responsibility for closure and post-closure in accordance with the following:

- (1) Closure and post-closure rules, including:
 - (A) 329 IAC 10-22 and 329 IAC 10-23;
 - (B) 329 IAC 10-30 and 329 IAC 10-31; or
 - (C) 329 IAC 10-37 and 329 IAC 10-38.
- (2) Sections 2 through 5 of this rule.

(c) Solid waste land disposal facilities that have operating permits in effect must not continue to operate unless they have established financial responsibility for post-closure by choosing a financial assurance mechanism under section 3(a) of this rule and by funding the same under section 3(b) of this rule.

(d) Solid waste land disposal facilities that have operating permits in effect must not continue to operate unless they have established financial responsibility for closure by choosing a financial assurance mechanism under section 2(a) of this rule and by funding the same under section 2(b) of this rule.

(e) Solid waste land disposal facilities that apply for permits after ~~the promulgation of this rule~~ **April 13, 1996**, must provide financial responsibility as required by ~~329 IAC 10-11-2(b)(12)~~. **329 IAC 10-11-2.5(a)(4)**. The documents establishing both the closure and post-closure financial responsibility must be executed by and approved by the commissioner prior to operation of the facility. In addition, the financial assurance mechanism must be funded under sections 2(b) and 3(b) of this rule prior to operation.